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ORIGINAL RESEARCH

Assessment of usefulness of USG in detection of ascites: An observational study

Prithviraj L Jadhav¹ Niranjana Bapusaheb Patil²

¹Assistant Professor ²Professor, Department of radio-diagnosis, DY Patil Medical College
Kohlapur

ABSTRACT

Background: The number of ascites patients is increasing day by day. The present study was to determine usefulness of USG in detection of ascites. **Materials & Methods:** This study was conducted on 62 patients with suspected cases of ascites of both genders. All patients were exposed to USG Scan. The ultrasound images were obtained in both longitudinal & transverse planes were taken. **Results:** Out of 62 patients, males were 28 and females were 34. Normal patients had total protein 8.0 g, total albumin 3.4 g and serum ascites albumin gradient was 0.2. Mild had total protein level of 8.2 g, total albumin was 3.3 and SAAG was 0.3, moderate had total protein level of 7.8 g, total albumin was 2.6g and SAAG was 0.7, severe had 6.6g, 2.5 and 0.2 of total protein, total albumin and SAAG level respectively. The SAAG ratio was significant (P- 0.01). Common causes of ascites was inflammatory (22), renal diseases (15), liver diseases (12), cardiac disease (8), tumor (2) and portal hypertension (3). The difference was significant (P<0.05). **Conclusion:** Ultrasonography a useful diagnostic aid in detection of ascites. They found that common reasons were inflammatory, tumor, renal diseases, liver diseases, cardiac disease and portal hypertension.

Key words: Ascites, Inflammatory, Ultrasonography

Corresponding author: Dr. Niranjana Bapusaheb Patil: Professor, Department of radio-diagnosis, DY Patil Medical College
Kohlapur

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INTRODUCTION

Ascites, the collection of fluid in the peritoneal cavity, occurs with a variety of disease states. It is one of the earliest and most common complications of chronic liver disease. The International Ascites Club had proposed a grading system for ascites.¹ The causes of ascites are liver cirrhosis, portal hyper tension, heart failure, hepatic venous occlusion, pericarditis, cancers, tuberculosis, pancreatitis, renal infections and other different causes. Ascites formation in malignancies of the abdomen and pelvis generally has been attributed to increased rates of formation intra peritoneal fluid and decreased rates of removal.²

Assessment of the volume of ascites is necessary in monitoring the progress of the disease and in selecting appropriate methods of treatment. In cirrhosis, it is associated with circulatory dysfunction characterized by arterial vasodilatation, high cardiac output and stimulation of vasoactive systems. It can occur secondary to a number of pathological conditions.³ In a large number of patients, cirrhosis of liver is the cause of ascites. Several factors contribute to the development of

ascites in chronic liver disease. Kidney plays a central role and is responsible for sodium and water retention, through complex mechanisms. The mechanism by which the diseased liver affects renal function is not fully understood.³USG has become more widely used in the assessment of ascites, many clinicians have also routinely integrated USG guidance into the paracentesis procedure. ⁴ The present study was to determine usefulness of USG in detection of ascites.

MATERIALS & METHODS

This study was conducted in department of Radiodiagnosis. It comprised of 62 patients with suspected cases of ascites of both genders. Ethical approval was obtained from institutional ethical committee prior to start of study. All were informed regarding the study and written consent was obtained.

Data such as name, age, gender etc. was recorded. All patients were exposed to USG Scan. The ultrasound images were obtained in both longitudinal & transverse planes were taken. Results were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I shows that out of 62 patients, males were 28 and females were 34. Graph I shows that normal patients had total protein 8.0 g, total albumin 3.4 g and serum ascites albumin gradient was 0.2. Mild had total protein level of 8.2 g, total albumin was 3.3 and SAAG was 0.3, moderate had total protein level of 7.8 g, total albumin was 2.6g and SAAG was 0.7, severe had 6.6g, 2.5 and 0.2 of total protein, total albumin and SAAG level respectively. The SAAG ratio was significant (P- 0.01). Table II shows that common causes of ascites was inflammatory (22), renal diseases (15), liver diseases (12), cardiac disease (8), tumor (2) and portal hypertension (3). The difference was significant (P<0.05).

Table I Distribution of patients

Gender	Males	Females
Number	28	34

Graph I Assessment of ascites fluid

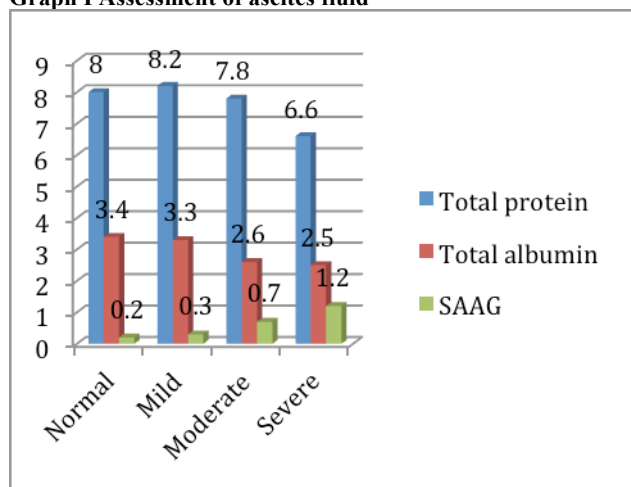


Table II Reason of Ascites

Reason	Number	P value
Inflammatory	22	0.05
Renal	15	
Liver disease	12	
Cardiac disease	8	
Tumor	2	
Portal hypertension	3	

DISCUSSION

Ascites is a common end point of multiple disease states that lead to leakage of fluid into the peritoneal cavity.⁵ The most common

etiology for ascites is liver dysfunction and hepatic cirrhosis, which lead to transudation of fluid into the peritoneum as a result of high portal venous pressures. Other significant causes of ascites include renal failure and cardiac failure. In developing nations, severe hypoalbuminemia from malnutrition is a frequent etiology. Furthermore, ascites may often be seen in cases of primary abdominal and gynecological malignancies, as well as in cancers that are metastatic to the liver.⁶ The accumulation of ascites results in progressive abdominal distention and significant patient discomfort. As abdominal pressure increases, elevation of the diaphragms leads to reduced lung volumes and lowered functional respiratory reserve. This often causes shortness of breath, especially when the patient is recumbent. The mechanism by which the diseased liver affects renal function is not fully understood.⁷ The present study was to determine usefulness of USG in detection of ascites.

In present study, out of 62 patients, males were 28 and females were 34. We observed that normal patients had total protein 8.0 g, total albumin 3.4 g and serum ascites albumin gradient was 0.2. Mild had total protein level of 8.2 g, total albumin was 3.3 and SAAG was 0.3, moderate had total protein level of 7.8 g, total albumin was 2.6g and SAAG was 0.7, severe had 6.6g, 2.5 and 0.2 of total protein, total albumin and SAAG level respectively.

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 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.⁸

We found that common causes of ascites was inflammatory (22), renal diseases (15), liver diseases (12), cardiac disease (8), tumor (2) and portal hypertension (3). The high frequency linear probe should be used to identify critical vascular structures within the abdominal wall. The anatomical location of the inferior epigastric artery and vein has considerable variation between patients. Furthermore, its location below the rectus muscle makes it effectively non-compressible if punctured.⁹ Patients with portal hypertension from cirrhosis may also have other vascular collaterals present within the abdominal wall that must be avoided. Historically, the midline line alba approach was promoted due to the hypothesis that this area was relatively avascular. However, one study found that multiple venous structures may course through this region in patients with portal hypertension. Therefore, accurate identification of abdominal wall vascular structures is critical in avoiding a hemorrhagic procedural complication. Vascular structures can first be identified using B-mode US, or grey scale imaging, by looking for the typical rounded appearance of artery and vein.¹⁰

CONCLUSION

Authors found ultrasonography a useful diagnostic aid in detection of ascites. They found that common reasons were inflammatory, tumor, renal diseases, liver diseases, cardiac disease and portal hypertension.

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