

**STUDY ON ETIOLOGY OF ASCITES**Konatham Rambabu<sup>1</sup>, M. K. M. Kathyayani<sup>2</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTARCT:** In this study 100 cases of ascites, evaluated for the etiological causes. And observed as cirrhosis with portal hypertension 82%, heart failure 8%, chronic kidney disease 3%, nephritic syndrome 2%, peritoneal calcinomatosis 2%, chronic pancreatitis 1% portal vein thrombosis 1%, Budd-chiari syndrome 1%. **AIM OF THE STUDY:** To study the various etiologies and their incidence of Ascites.

**INTRODUCTION:** The term ascites is derived from the Greek word "ASKOS" (bladder, belly, bag) and denotes the presence of excessive fluid in the peritoneal cavity.<sup>(1)</sup> Many diseases are known to lead to the formation of free fluid within the peritoneal cavity. Basically the causes of ascites may be grouped into those conditions in which the pathological process does not directly affect the peritoneum and those in which the peritoneum itself is involved. The first group includes diseases associated with sinusoidal portal hypertension (cirrhosis, acute alcoholic hepatitis, fulminant or subacute viral or toxic hepatitis, congestive heart failure, constrictive pericarditis, IVC obstruction, Budd-Chiari syndrome, hepatovenous occlusive disease) hypoalbuminaemia (Nephrotic Syndrome, protein-losing enteropathy, and malnutrition), and a variety of disorders that may cause ascites through different mechanisms, such as myxoedema, ovarian diseases (carcinoma, benign tumours, ovarian hyper stimulation syndrome), chronic pancreatitis, biliary-tract leakage (secondary to liver trauma, biliary-tract surgery, or transhepatic cholangiography), diseases affecting the lymphatic system of the splanchnic area and chronic renal failure. In the second group, as<sup>(1)</sup>ascites is formed as a consequence of primary peritoneal disease or as a result of peritoneal involvement in systemic process; tuberculosis, fungal (Candida albicans, Coccidioides immitis), parasitic and granulomatous peritonitis (sarcoidosis, Crohn's disease, peritoneal granulomatous reaction to talc, cotton, wood fibers, starch and barium), primary or metastatic peritoneal tumours, vasculitis (systemic lupus erythematosus, Henoch-Schonlein purpura), eosinophilic gastroenteritis, and Whipples disease are the most characteristic causes of ascites in this group.<sup>(2)</sup> The evaluation of a patient with ascites requires that the cause of the ascites to be established. In most cases ascites appears as part of a well-recognized illness such as cirrhosis, congestive heart failure, nephrosis or disseminated carcinomatosis, in these situations the physician should determine that the development of ascites is indeed a consequence of the basic underlying disease and not due to the presence of a separate or related disease process. This distinction is necessary even when the cause of ascites seems obvious.

Diagnostic paracentesis (50-100ml) should be part of the routine<sup>(3)</sup> evaluation of the patient, with ascites. The fluid should be examined for its gross appearance, protein content, albumin level, cell count, and differential cell count, should be determined and gram's and acid fast stains and culture should be performed. Cytologic and cell block examination may disclose an

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otherwise unsuspected carcinoma. Serum ascites albumin gradient (SAAG)<sup>(4)</sup> should be calculated to determine whether the fluid has features of a transudate or an exudate. The gradient correlates directly with portal pressure, a gradient  $>1.1\text{gm/dl}$ , high gradient ascites is characteristic of uncomplicated cirrhotic ascites and differentiates ascites due to portal hypertension  $>97\%$  of the time. Other etiologies of high gradient ascites include alcoholic hepatitis, congestive heart failure, hepatic metastasis constrictive pericarditis and Budd chiari Syndrome. A gradient  $<1.1\text{gm/dl}$  (Low gradient) suggests that the ascites is not due to portal hypertension with  $>97\%$  accuracy and mandates a search for other causes such as peritoneal carcinomatosis, tuberculosis peritonitis, pancreatitis, serositis, pyogenic peritonitis, and nephrotic syndrome. Blood stained fluid with  $>2.5\text{gm/dl}$  protein is unusual in uncomplicated cirrhosis but is consistent with tuberculosis peritonitis or neoplasm. Cloudy fluid with predominance of polymorphonuclear cells  $>250/\text{micro litre}$  and a positive Gram's stain are characteristic of bacterial peritonitis, which requires antibiotic therapy, if most cells are lymphocytes tuberculosis should be suspected. Chylous ascites refers to a turbid milky or creamy peritoneal fluid due to presence of thoracic or intestinal lymph. Such fluid shows sudan staining fat globules microscopically and an increased triglyceride content by chemical examination. Opaque milky fluid has a triglyceride concentration  $>1000\text{ mg/dl}$ , but a triglyceride Concentration  $>200\text{mg}$  is sufficient for diagnosis. A turbid fluid due to leukocytes, or tumour cells may be confused with chylous fluid (pseudochylous) and it is often helpful to carry out alkalization and ether extraction of the specimen. Alkali tends to dissolve cellular proteins and thereby reduce turbidity, ether extraction leads to clearing if the turbidity of the fluid is due to lipid. Chylous ascites is often the result of lymphatic disruption, or obstruction from cirrhosis, tumour, trauma, tuberculosis, filariasis, or congenital abnormalities. It may also be seen in nephrotic Syndrome.

**MATERIALS AND METHODS: SELECTION OF CASES:** In this study 100 cases were selected randomly in patients who presented with ascites and got admitted in the medical wards. After clinical Diagnosis, diagnostic paracentesis and ultrasonogram were done to confirm the same in all cases in this study.

**METHODS:** A detailed history and clinical data was collected using the proforma.

The following investigations have been done in all the patients in this study. Blood complete hemogram, Random Blood Sugar, Blood Urea, Serum Creatinine, Serum Sodium, Serum Potassium, Urine Albumin, Urine Sugar, Deposits, X-ray Chest PA view, ECG, USG abdomen, Liver function tests, Ascitic Fluid Analysis (bio chemical analysis and cytology), UGI scopy. Other special investigations like echocardiogram, 24hrs urine protein, Serum amylase, Ascitic fluid amylase, Serum  $\alpha$  feto - protein, Adenosine deaminase etc. were done in selective cases whenever needed as follows,

Along with Ascites if the clinical picture was suggestive of heart disease, Echocardiogram was done.

In addition to ascites if the clinical picture was suggestive of nephrotic syndrome, 24hrs urine protein and serum lipid profile done.

If the clinical picture was suggestive of malignant ascites, ascetic fluid cytology for malignant cells and  $\alpha$  feto-protein were looked for.

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## Tests and Methods:

- Blood sugar estimated by Glucose oxidase- peroxidase method.
- Blood urea estimated by Bertheld method.
- Serum creatinine estimated by Jaffe's kinetic method.
- Serum Na<sup>+</sup> and serum K<sup>+</sup> estimated by flame photometer.
- Serum bilirubin estimated by Malloy Evelyn method.
- Serum protein estimated by Biuret method.
- ALT estimated by kinetic method- IFCC.
- AST and Alkaline phosphatase estimated by kinetic method.
- Ascitic fluid Glucose estimated by GOD POD method.
- Ascitic fluid protein estimated by Sulpho-salicylic acid method.
- Serum amylase and ascitic fluid amylase estimated by kinetic method.
- 24 hrs Urine protein estimated by sulpho-salicylic acid method.

## RESULTS AND OBSERVATIONS:

**In this study of 100 cases of ascites, the etiology and its incidence is observed as,**

Sl. No	Etiology	No. of cases	% of cases
1	Cirrhosis with portal hypertension	82	82
2	Heart Failure	8	8
3	Chronic kidney disease	3	3
4	Nephrotic syndrome	2	2
5	Peritoneal carcinomatosis	2	2
6	Pancreatitis	1	1
7	Portal vein thrombosis	1	1
8	Budd- Chiari syndrome	1	1
	No. of Cases	100	100

Table 1

- Cirrhosis with portal hypertension is the most common cause for ascites.

## Sex distribution in cirrhosis of liver observed as below:

	Number of cases	%
Male	59	71.05
Female	23	28.05
<b>Total</b>	<b>82</b>	<b>100</b>

Table 2

- Cirrhosis of liver is common in males.

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### The role of alcoholism in cirrhosis of liver observed as:

<b>No. of cases with cirrhosis</b>	<b>82</b>
No. of cases with alcoholic liver disease	53
% of cases	64%

Table 3

- Alcoholic liver disease is the commonest cause for cirrhosis.

### Serum protein value in cirrhosis with ascites:

Serum protein gms/dl	No. of cases	%
>6	4	4.87
4-6	62	75.60
2-4	16	19.53
<b>Total</b>	<b>82</b>	<b>100</b>

Table 4

- In cirrhosis with ascites hypoproteinaemia was present in 95% of cases.

Serum albumin gms/dl	No. of cases	%
>3.3	4	4.87
2.2-3.3	62	75.60
1.1-2.2	16	19.53
<b>Total</b>	<b>82</b>	<b>100</b>

Table 5

- In cirrhosis with ascites hypoalbuminaemia was present in 95% of cases.

### The incidence of hypoalbuminaemia in cases of cirrhosis with ascites:

No. Of cases of ascites due to cirrhosis with hypoalbuminaemia	78	95%
No. of cases of ascites due to cirrhosis with normal albumin level	4	5%
No. of cases of ascites due to cirrhosis	82	100%

Table 6

- In cirrhosis with ascites hypoalbuminaemia was present in 95% of cases.

### In this study in cases of cirrhosis with portal Hypertension:

**SAAG value is observed as;<sup>(5)</sup>**

SAAG	No. of Cases	%
>1.1	76	92.6
<1.1	6	8.4

Table 7

- IN cirrhosis with portal hypertension SAAG value is more than 1.1 in 92.6% of cases.

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**In this study incidence of pleural effusion along with ascites as follows;**

Total number of cases with ascites	100
Total number of cases with ascites and pleural effusion	8
% of cases	8
Table 8	

- In cases of ascites, pleural effusion was present only in 8 % of cases and the effusion was common in right side.

**In this study in cases of ascites, side of the pleural effusion observed as;<sup>(6)</sup>**

Right side effusion	6	75%
Left side effusion	1	12.5%
B/L effusion	1	12.5%
Total number of cases	8	100%
Table 9		

- In ascites pleural effusion is common in right side.

**The incidence of portal hypertension in cases of ascites due to Cirrhosis;<sup>(7)</sup>**

No. of cases of ascites due to cirrhosis	82 cases
No. of cases of ascites due to cirrhosis with portal hypertension	82 cases
Table 10	

- Portal hypertension was present in all the cases of ascites due to cirrhosis.

**DISCUSSION:** In this study of 100 cases of ascites, the etiology and its incidence is observed as,

1. Cirrhosis with portal hypertension 82%.
2. Heart Failure 8%.
3. Chronic kidney disease 3%.
4. Nephrotic syndrome 2%.
5. Peritoneal calcinomatosis 2%.
6. Chronic pancreatitis 1%.
7. Portal vein thrombosis 1%.
8. Budd-Chiari syndrome 1%.

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1. Cirrhosis with portal hypertension was the most common cause for Ascites and Heart failure was the second most common cause of ascites.<sup>(8)</sup>
2. In this study, of the 82 cases of cirrhosis with portal hypertension, 59 cases were male and 23 cases were female. Of the 59 male cases 44 cases were alcoholics – alcoholism is the commonest cause for cirrhosis with portal HT in male.<sup>(9)</sup>
3. Chronic pancreatitis was the cause for ascites in one case of Ascites, and alcoholism was the cause for pancreatitis.<sup>(10)</sup>
4. In this study along with ascites, pleural effusion was present in 8 cases (8%) of ascites. Of the 8 cases, 6 cases presented with Right sided effusion (75%), 1 case presented with Left sided effusion (12.5%), 1 case presented with Bilateral effusion (12.5 %).<sup>(11)</sup>
5. In cirrhosis with Portal hypertension, serum protein ranges between 2–6 grams. 75.6% have 4–6 grams, 19.5% have 2–4 grams, 5% have >6 grams, and 5% cases have normal protein value. In the study of Runyon total ascitic protein concentration ranges between 0.5 grams and more than 6 grams and is greater than 3 grams in up to 30% of patients with other uncomplicated ascites.
6. In cirrhosis with Portal hypertension, serum albumin values ranges between 1.1 grams to 3.3 grams.
7. 5% of cases had normal protein and albumin and these cases presented with ascites, in those cases portal hypertension was present which was evident by oesophageal varices. So the cause of ascites in those cases was portal hypertension. In this study in cirrhosis with Portal hypertension 76 cases (93.7%) were having SAAG value more than 1.1, 6 cases (6.3%) were having SAAG value less than 1.<sup>(12)</sup>
8. In this study, 8 cases of ascites were caused by heart failure. Of which 5 cases (62.5%) were caused by CAHD and 3 cases (37.5%) were caused by Rheumatic heart disease.<sup>(13)</sup>
9. In heart failure, 6 cases (75%) had Ejection fraction <60% and 2 cases (25%) had an ejection fraction > 60 % and both of these cases were caused by RHD.<sup>(14)</sup>

### CONCLUSION:

1. This study shows Cirrhosis with portal hypertension was the most common cause for ascites (82%) and the next common cause for ascites was heart failure (8%) followed by renal diseases (5%)-chronic kidney disease, nephrotic syndrome and other rare causes including peritoneal carcinomatosis, portal vein thrombosis, Budd-chiari syndrome all together were 5% only.
2. In this study 79% of ascites were found to be high gradient ascites and 11 % were low gradient ascites.
3. In this study portal hypertension was present in all the case of ascites due to cirrhosis, as evidenced by oesophageal varices in UGI scopy, whereas hypoproteinaemia was present only in 95 % which shows portal hypertension is the major cause for ascites in Cirrhosis.
4. In cirrhosis with portal hypertension alcoholic liver disease was the commonest cause (64%).
5. Among alcoholics in one case the ascites was due to pancreatitis and not due to cirrhosis of liver.

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6. Among the renal causes for ascites which was 5%, the incidence of chronic kidney disease (3%) and nephrotic syndrome (2%) were almost same.
7. In this study malignant ascites was only 2%.

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