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### RESEARCH ARTICLE

#### CLINICAL PROFILE OF ASCITES BASED ON PRESENTATION AND LABORATORY FINDINGS: AN INSTITUTIONAL EXPERIENCE FROM MAHARASHTRA, INDIA

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#### Abstract

**Introduction:** Ascites is the fluid collection in the potential space of the peritoneal cavity. Alcoholic liver disease and intra-abdominal malignancy are two major etiologies behind it. Also, diagnosis of tuberculous ascites should be thought of due to endemicity. Cirrhotic patients at any time during the course of disease, invariably present with ascites which is one of the marker of decompensation. In our context, etiology behind ascites and its correlation with symptoms and clinical findings not yet studied, so present study is conceptualised.

**Aim:** To study clinical profile of ascites based on presentation and laboratory findings

**Methods:** This is a cross-sectional retrospective descriptive hospital based record review of patients presented with ascites in a tertiary center of Maharashtra. One hundred fourteen patients with ascites under regular follow up of SMBT Hospital were reviewed. Data regarding presenting complaints, examination findings, relevant investigations during first visit and final diagnosis were retrieved from our own record keeping and recorded information were then evaluated.

**Results:** Patients having ascites have myriad of symptoms and signs, commonest clinical feature being icterus (74, 64.9%). Most of them were anemic at presentation. Forty-two (36.8%) had high blood urea and 36 (31.5%) with high creatinine suggesting approximately 30-40% cases presented with deranged renal function test. Ninety-three (81.5%) had raised total serum bilirubin. Similarly, PT/INR derangements were in 74 (64.9%) and 57 (50%) suggesting deranged liver function. Serum albumin was less than 3.5 gram/decilitre in 83(72.8%) cases. Among the patients studied, 80 (70.1%) had high Serum-Ascites Albumin Gradient (SAAG) suggesting transudative type of ascites and rest 34 had low SAAG suggesting exudative type of ascites. Overall assessment revealed, majority of patients (71.05%) had Chronic liver disease (CLD) as the cause of ascites.

**Conclusions:** Ascites due to chronic liver disease was the main finding with etiology supported by laboratory findings. Significant numbers of the patients had deranged renal function on top of liver function derangement, so these parameters need to be properly taken care of.

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**Introduction:-**

Ascites is the fluid collection in the peritoneal cavity. Different pathologies with unique patho-mechanism give rise to ascites. Alcoholic liver disease, intra-abdominal malignancy, non-alcoholic cirrhosis and malignancy with cirrhosis are common causes in descending sequence (1). Ascites is one spectrum of liver cirrhosis and portal hypertension. Cirrhotic patients at a time invariably present with ascites and is a marker of decompensation. In these cases, severity has to be evaluated and case should be managed appropriately with salt restriction, diuretics, therapeutic paracentesis or surgical shunt procedure alone or in combination (2). Several gastrointestinal and ovarian malignancies present with ascites and malignant ascites is a grave prognostic sign of the diseased individual with poor survival (3,4). Tuberculous peritonitis also needs to be kept in differential and culture growth is the gold standard test for diagnosis tuberculous peritonitis(6) .

In our context, etiologies behind ascites and its correlation with symptoms and clinical findings is not yet studied and is still unknown, so present study is conceptualised to evaluate the cases of ascites in terms

**Methods:-**

This was a cross-sectional retrospective descriptive hospital based record review of a tertiary center of Maharashtra . This non-invasive descriptive study was done over records of all new patients presented with ascites in department of General medicine . One hundred fourteen cases of ascites under follow up were reviewed. This record review was done over three months after the approval of IEC . After approval from the General medicine department and IEC, proper reviewing of the cases started. Data regarding presenting symptoms, examination findings, appropriate investigations including non-invasive serum ascites albumin gradient during first visit and final diagnosis were retrieved from our own record keeping and recorded information were evaluated. The recorded data entered thoroughly and analysed using SPSS version 22 and excel computer program.

Among the patients of ascites presented in our center, we initially sent baseline blood investigations namely complete blood count, random blood sugar, liver biochemistry and liver and renal function tests, and serum electrolytes to evaluate the overall status of the patients along with the functional status of liver. Also, specifically to identify the etiology and approach the case we also sent hepatitis virus serology, diagnostic tapping of the ascitic fluid, ultrasound of the abdomen and contrast enhanced computed tomography (CECT) of the abdomen when indicated. We followed FDA value for standard laboratory finding interpretation. of clinical features and laboratory investigations in our setting based on our hospital.

**Aim:-**

To study clinical profile of ascites based on presentation and laboratory findings

**Inclusion Criteria-**

All cases of ascites above 16 years of age

**Exclusion Criteria-**

Patients not willing for participation in study

**Results:-**

The mean age of the patients studied was  $54.89 \pm 12.99$  years with minimum being 16 years and maximum being 82 years. Among all, 28 (24.6%) were females while rest 86 (75.4%) were males. Patients having ascites have myriad of other symptoms and signs just few to name like jaundice (icterus), weight loss, anorexia, abdominal pain etc. Commonest clinical feature being icterus (74, 64.9%) followed by anorexia (53, 46.4%). Amongst clinical features, abdominal pain, fever and icterus had significant association with ascites ( $p < 0.05$ ) (Table 1.).

**Table 1:-** Sign and symptoms at presentation among cases of ascites.

Variables	Features	CLD	Right Heart failure	Abdominal malignancies	Tubercular Peritonitis	Total	P-value
Weight loss	No	58	5	10	3	76	0.067
	Yes	23	1	8	6	38	
Pruritus	No	74	5	17	9	105	0.658
	Yes	7	1	1	0	9	
Anorexia	No	46	3	10	2	61	0.266
	Yes	35	3	8	7	53	
Abdominal Pain	No	49	6	7	3	65	0.024
	Yes	32	0	11	6	49	
Myalgia	No	72	5	14	8	99	0.639
	Yes	9	1	4	1	15	
Nausea and Vomiting	No	46	5	9	6	66	0.497
	Yes						

	Yes	35	1	9	3	48	
<b>Fever</b>	No	66	6	13	4	89	0.036
	Yes	15	0	5	5	25	
<b>Dark colored urine</b>	No	65	6	12	9	92	0.117
	Yes	16	0	6	0	22	
<b>Pallor</b>	No	60	5	13	6	84	0.909
	Yes	21	1	5	3	30	
<b>Splenomegaly</b>	No	64	5	15	9	93	0.486
	Yes	17	1	3	0	21	
<b>Icterus</b>	No	22	4	6	8	40	0.0009
	Yes	59	2	12	1	74	
<b>Leukonychia</b>	No	74	5	16	9	104	0.692
	Yes	7	1	2	0	10	

<b>Spider naevi</b>	No	71	6	18	9	104	0.215
	Yes	10	0	0	0	10	
<b>Hepatomegaly</b>	No	61	5	14	9	89	0.393
	Yes	20	1	4	0	25	

Among the patients of ascites evaluated, total leukocyte counts were raised in 24 (21.05%). Most (105, 92.1%) of the patients were anemic at presentation based on FDA demarcation. Total 46 (40.35%) cases were hyponatremic. Forty-two (36.8%) had high blood urea and 36 (31.5%) with high creatinine suggesting approximately 30-40% cases presented with deranged renal function test. Ninety-three (81.5%) had raised total serum bilirubin while SGPT and SGOT were high in 94 (82.4%) and 72 (63.1%) respectively. Similarly, PT/INR derangements were in 74 (64.9%) and 57 (50%) suggesting deranged liver function. Serum albumin was less than 3.5 gram/decilitre in 83(72.8%) cases. Among the patients studied, 80 (70.1%) had high SAAG suggesting transudative type of ascites and rest 34 had low SAAG suggesting exudative type of ascites.(Table 2.)

**Table 2:-** Laboratory parameters.

Variables	Features	CLD	Right Heart failure	Abdominal malignancies	Tubercular Peritonitis	Total	P-value
Total Count	<4000	3	1	4	0	8	0.050
	Normal (4-11000)	62	5	9	6	82	
	>11000	16	0	5	3	24	
Hemoglobin	M (14-17.5) F (12.3-15.3)	8	0	1	0	9	0.602
	Anemic	73	6	17	9	105	

Random Blood Sugar	Normal (99-140)	44	4	8	6	62	0.691
	<99	23	2	6	3	34	
	>140	14	0	4	0	18	
Urea	Normal (20-40)	52	1	12	7	72	0.088
	High	29	5	6	2	42	
Creatinine	Normal (.6-1.1)	55	2	14	7	78	0.210
	High (>1.1)	26	4	4	2	36	
Na+	Normal (135-147)	43	3	13	8	67	0.401
	Low (<135)	37	3	5	1	46	
	High (>147)	1	0	0	0	1	
K+	Normal (3.5-5.5)	69	5	17	9	100	0.626
	Hypokalemia	9	1	0	0	10	

	Hyperkalemia	3	0	1	0	4	
Total serum bilirubin	Normal (<1)	4	4	6	7	21	0.000
	High (>1)	77	2	12	2	93	
Direct serum bilirubin	Normal (<0.4)	5	3	7	6	21	0.000
	High (>0.4)	76	3	11	3	93	
SGPT	Normal (0-30U/L)	10	3	5	2	20	0.062
	High (>30U/L)	71	3	13	7	94	
SGOT	Normal (0-40)	21	5	10	6	42	0.001
	High (>40 U/L)	60	1	8	3	72	
ALP	Normal (50-160)	48	5	11	3	67	0.267
	High (>160 U/L)	33	1	7	6	47	
Prothrombin	Normal (9.5-	21	4	9	6	40	0.010

	13.5)						
	High(Prolonged)	60	2	9	3	74	
INR	Normal (<1.3)	29	4	15	9	57	0.000
	Prolonged	52	2	3	0	57	
Serum Protein	Normal (6.3-8)	42	5	3	6	56	0.0083
	Low (<6.3)	39	1	15	3	58	
Serum Albumin	Normal (3.5-5.5)	24	2	4	1	31	0.624
	Low (<3.5)	57	4	14	8	83	
HbsAg	Negative	77	6	17	9	109	0.848
	Positive	4	0	1	0	5	
Ascitic protein	>2.5 g/dl	52	3	11	0	66	0.003
	≥2.5 g/dl	29	3	7	9	48	



SAAG	Exudative ( $\leq 1.1$ )	12	4	9	9	34	0.000
	Transudative ( $> 1.1$ mg/dl)	69	2	9	0	80	

Overall assessment revealed, most (81, 71.05%) of the had chronic liver disease, as the culprit, among them 5 had chronic hepatitis B virus related hepatitis while rest 76 had alcohol related liver disease. Other causes of ascites were tubercular peritonitis, right heart failure and intra abdominal malignancies including carcinoma stomach, carcinoma ovary, hepatocellular carcinomas and pancreatic cancer.

Most of the cases of CLD had transudative type of ascites (high SAAG) and in other causes it was exudative (low SAAG), and the p-value was correlated (Table 3.).

**Table 3:-** SAAG correlating with diagnosis.

Diagnosis	Exudative	Transudative	Total	p-value
CLD	12	69	81	0.000
Congestive Heart failure	4	2	6	
Abdominal malignancies	9	9	18	
Tubercular Peritonitis	9	0	9	
Total	34	80	114	

### Discussion:-

Ascites is a lethal presentation, with myriad of cause behind. This presentation is common all over the world in medical practice. Its early detection is required to ensure effective management without any complications.

In our case, among 114 cases of ascites studied, 71.05% were due to chronic liver disease while 15.7% were due to abdominal malignancies. Other studies also show somehow similar results with CLD representing about 80% of the cases while malignant ascites accounting 10% of the cases(7,8) . In contrast, another study from northern India showed cirrhosis to be the predominant cause of ascites (60.78%), followed by tuberculosis (15.68%) and rest 37% being other causes (9).

Similarly, another Indian study concluded cirrhosis and tuberculous ascites being common etiology of ascites(10).

The overall laboratory parameters were not assessed in previous studies to accurately depict the clinical condition of the patient whereas present study attempts to show the clinical profile of the ascites patients to predict the physiological status of the patients. This study showed about 40% of the cases had hyponatremia and 30-40% of the cases had deranged renal function which suggests that fluid and electrolyte balance as well as dose of medications like diuretics need to be calculated meticulously. Our data showed the deranged liver function in 60-80% of the cases, predisposition to hypoglycemia as well as bleeding episodes either due to rupture esophageal varices in cirrhotic cases or due to deranged clotting profile as depicted by PT/INR values. So, these simple parameters should also be taken care of when a case of ascites present.

Out of the patients studied, 80 (70.1%) had transudative, and rest 34(29.9%) had exudative type of ascites. Similar findings were shown by a study from Bihar India. SAAG is the important test in patients in whom cause of ascites is still needing to be rectified. SAAG value strongly correlates with the etiology, whether it is due to CLD or other pathology like malignancies and whether the ascites is transudative or exudative(11, 12) . In our study, among the CLD patients, most of them had transudative ascites while 12 patients had exudative ascites, indicating concurrent SBP. Where SAAG findings correlates the diagnosis ( $p=.000$ ). Similarly, among patients with coexisting heart failure with TB peritonitis, SAAG was low. SAAG was high in patients with intraabdominal malignancy overlapping with CLD. All tubercular peritonitis patients had exudative form of ascites.

The findings obtained from this study is inferred from single centered small sized cross-sectional study so clinical and laboratory findings need to be studied in larger population to put concluding remarks to guide approach of the ascitic patients.

### Conclusion:-

The study highlights chronic liver disease as the most common culprit for ascites, which follows abdominal malignancies. It also correlates etiology of ascites with the simple and non-invasive laboratory parameters like serum albumin ascites gradient amongst others. Significant numbers of the patients had deranged renal function on top of deranged liver function, so these parameters need to be taken care of.

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