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An Etiological Profile of Ascites in Patients Attending a Tertiary Care Center in Kumaon Region of Uttarakhand

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Abstract

Introduction: Ascites is the accumulation of free fluid in the peritoneal cavity. The etiological profile and spectrum of ascites is vast and includes pathology of multiple systems. Portal hypertension (including causes of portal hypertension like cirrhosis), abdominal tuberculosis, congestive heart failure, renal disease and disseminated malignancy are the common causes. Some patients have more than one aetiological factor. This study was performed as similar data on such patients from this particular area was still not available.

Aim and objective: To observe the etiology of ascites in hospitalised patients.

Material and Methods: A 2-year hospital-based cross-sectional observational study was conducted in the Department of Medicine in a tertiary care centre in Kumaon region of Uttarakhand in northern India. 100 patients, aged 16 years or above, with proven ascites were diagnosed on the basis of history, physical examination and investigations were included.

Results: A total of 100 participants, mean age 46 ± 13 years were included in this study, with 61 males and 39 females. Chronic liver disease was the most common cause in 61%, followed by abdominal tuberculosis in 12%, congestive heart failure in 11% and malignant ascites in 8%. Less common causes were hypothyroidism in 2%, chronic kidney disease in 1% and nephrotic syndrome in 1%. It was found to be multi-factorial in 1%.

Conclusion: Ascites and its etiology should be diagnosed early to prevent its complications. Varying etiological factors require different modalities of treatment hence, identification of exact etiology are necessary for prognosis and appropriate treatment.

Keywords: SAAG, Chronic Liver Disease, Abdominal Tuberculosis, Malignant Ascites

Introduction

The word ascites (Greek askos) means bag or sac. Ascites is a pathologic fluid collection within the abdominal cavity.[1-5] Healthy men have little or no intra-peritoneal fluid, but women may normally have as much as 20 ml, depending on the phase of their menstrual cycle. The pathologic fluid accumulates because of conditions directly involving the peritoneum

(infection, malignancy), or due to other diseases remote from the peritoneum (*i.e.*, liver disease, heart failure, hypo-proteinaemia).[6-7]

Diagnostic paracentesis is the key initial investigation in the assessment of ascites.[2-4] Traditionally, ascites was divided into 2 types, transudative and exudative type. A more meaningful system of Serum-ascites albumin gradient (SAAG) is now used, derived by subtracting ascitic fluid albumin from serum albumin. High Gradient is referred to as fluid having SAAG > or = 1.1g/dl, while on the other hand SAAG <1.1g/dl is referred to as Low Gradient.[8]

Cirrhosis is the leading cause of ascites in both developed and developing countries. Tuberculosis is the second most common cause in developing nations in comparison to developed nations where malignancy follows cirrhosis.[9-11]

Epidemiological data on the etiological aspects of ascites are insufficient from this region of Uttarakhand. Therefore, this study was planned and conducted in a tertiary care hospital. Our research study investigates the main causes of ascites in this particular region.

Materials and Methods

This prospective observational study was carried out in the Department of Medicine at Government Medical College and associated Dr. Susheela Government Hospital, Haldwani from November, 2017 to March, 2019. The hospital caters to Kumaon region of Uttarakhand and adjacent areas of Uttar Pradesh and Nepal.

Inclusion Criteria: All consenting adult patients with the following features:

1. Aged 16 years and older
2. Evidence of ascites on clinical abdominal examination, by either positive shifting dullness or fluid thrill were included in the study

Exclusion Criteria: All patients who were unwilling to be included in the study.

A written consent was taken from all potentially eligible subjects and subjects were excluded if they were not matched with inclusion criteria of the study. A structured questionnaire, prepared in English and Hindi, was used to collect information from each patient. The information obtained included demographic data, age, occupation, marital status, educational level, socio-economic status (Modified Kuppuswamy Scale). Relevant history on ascites/abdominal distension (duration, onset, progression, aggravating, and relieving factors) including past, family, smoking, alcohol habit was recorded. Any associated factors/symptoms, physical findings were included. The patients were subjected to lab and imaging investigation results like complete blood count, blood sugar, liver function tests, kidney function tests, urine routine examination, peripheral smear, abdominal paracentesis and ultrasound abdomen. Ascitic fluid was analysed for cytology, biochemistry, gram staining, acid fast bacillus staining, malignant cells, culture, and sensitivity. Computed tomography of the abdomen, upper gastro-intestinal endoscopy, 2D-echocardiography was done, wherever indicated. The final diagnosis reached at was incorporated. The data, thus collected, was analysed on Microsoft Excel 2007 and the frequency and percentages were calculated and results were expressed in tables and figures.

Results

The age group of study population ranged from 20 years to 75 years and the mean age was 46 ±13 years. Thirty nine (39%) were females and 61 (61%) were males. Majority of patients, 26 (26%), were in the age group of 36–45 years.

Of 100 patients, high SAAG (>1.1 g/dl) was observed in 76 patients and 24 patients had low

SAAG (<1.1 g/dl). Of 100 patients, a total of 15 patients had spontaneous bacterial peritonitis.

Ascitic fluid cytology for malignant cells was positive in 2 patients.

Chronic liver disease was the found in 61 patients (61%). Among 61 patients with chronic liver disease, 38 patients were chronic alcoholics without other risk factors; 6 patients were Hepatitis B surface antigen reactive out of which 2 were chronic alcoholics; 17 patients had Anti-hepatitis C virus antibody in serum out of which 5 patients were chronic alcoholics and 1 patient had HIV co-infection with history of alcoholism. Tuberculosis was the cause of ascites in 12 patients (12%) out of which 2 patients had HIV co-infection. Congestive heart failure was the cause of ascites in 11 patients (11%) out of which 5 had heart failure with reduced ejection fraction, 4 had cor pulmonale and 2 had simultaneous chronic liver disease. Malignant ascites was detected in 8 patients (8%) out of which 4 were carcinoma of unknown origin, 1 carcinoma gall bladder, 1 hepatocellular carcinoma, 1 ovarian carcinoma and 1 pancreatic carcinoma. There were 2 patients of hypothyroidism, 1 of end-stage renal disease, 1 patient of extra-hepatic portal vein obstruction, 1 of nephrotic syndrome, 1 of complicated malaria, 1 of pyoperitoneum and 1 of ruptured liver abscess.

Discussion

Etiology of ascites can be suspected from history and examination, but ascitic fluid analysis is an important investigation to diagnose the cause. The majority of patients who present with ascites have underlying cirrhosis, with the remainder being due to malignancy, heart failure, tuberculosis, pancreatitis, and other rare causes. [1-4]

Chronic liver disease was the found in 61 patients (61%). Among 61 patients with chronic liver disease, 38 patients were chronic alcoholics without other risk factors; 6 patients were Hepatitis B surface antigen reactive out of which 2 were chronic alcoholics; 17 patients had Anti-hepatitis C virus antibody in serum out of which 5 patients were chronic alcoholics and 1 patient had HIV co-infection with history of alcoholism. Similar results have been found in the studies conducted by Runyon et al [13], Kumar B et al [14], Adhikari P et al [15], Amarapurkar et al[12] and Khan FY et al [9].

The proportion of tuberculous peritonitis was 12% in this population out of which 2 patients had HIV co-infection, similar to 10.6% reported by Bandar, et al [16] in Saudi Arabia, but less common compared to a proportion of 20-23% reported in Nigeria and Pakistan [11,17]. And the highest proportions were reported at 43-66% among patients with exudative ascites in Pakistan[18,19]. The lower proportion of tuberculous peritonitis in this study may be due the fact that we included all patients with ascites while others had included only patients with exudative ascites. Nonetheless, these observations may also be due to differences in the prevalence of tuberculosis in these populations, since the prevalence of Tuberculosis 2011 in Pakistan and India was reported to 350 and 249 per 100,000 population respectively [20]. The HIV epidemic has been associated with increased prevalence of tuberculous peritonitis, and has been reported to account for up to 20-50% of all cases of ascites[21,22].

Malignant ascites was observed in 8 cases (8%) in this study out of which 4 were carcinoma of unknown origin, 1 carcinoma gall bladder, 1 hepatocellular

carcinoma, 1 ovarian carcinoma and 1 pancreatic carcinoma. Malignant ascites accounts for approximately 10% of all cases of ascites. [23] Tumors causing carcinomatosis are more commonly secondary peritoneal surface malignancies which include: Ovarian, colorectal, pancreatic, and uterine; extra-abdominal tumors originating from lymphoma, lung, and breast; and a small number of unknown primary tumors. [19]

Conclusion

In our study, chronic liver disease was the most common cause of ascites, followed by abdominal tuberculosis, congestive heart failure, malignant ascites, hypothyroidism, complicated malaria, extra-hepatic portal vein obstruction, end-stage renal disease, nephrotic syndrome, pyoperitoneum and ruptured liver abscesss.

The early diagnosis of ascites is required to ensure effective management without any complications. It may be due to hepatic or extra-hepatic causes. Treatment depends upon the cause of the ascites. Dietary sodium restriction and diuretics remains the first line therapy for its management in most causes. Ascites itself is not fatal, unless it becomes infected.

Recommendations

The risk factors for ascites exist in quite a few adult patients and are related to age, occupation, history of unprotected sexual exposures, intra-venous drug abuse and blood transfusion. Screening of clinical features of liver disease and enquiring for its bio-social risk factors is recommended in the primary care setting. Further large scale studies are needed to describe the characteristics of patients with malignant ascites in our settings and to study other causes of ascites that are not so uncommon in depth, which can help in designing effective interventions at community level for prevention and management.

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Legends Table and Graph

Table no 1. Distribution of Etiology of Ascites of patients

Etiology of Ascites		No of patients (n=100)	Percentage (%)
Chronic Liver Disease	Chronic Alcoholic	38	38
	HBsAg Reactive	6	6
	Anti-HCV Reactive	17	17
	Total	61	61
Abdominal Tuberculosis		12	12
Congestive Heart Failure	HFrEF	5	5
	With DCLD	2	2
	Cor Pulmonale	4	4
	Total	11	11
Malignant Ascites	Unknown Primary	4	4
	Ca Gall Bladder	1	1
	Hepatocellular Ca	1	1
	Ovarian Ca	1	1
	Pancreatic Ca	1	1
	Total	8	8
Hypothyroidism		2	2
Complicated Malaria		1	1
Extra-Hepatic Portal Vein Obstruction		1	1
End-Stage Renal Disease		1	1
Nephrotic Syndrome		1	1
Pyoperitoneum		1	1
Ruptured Liver Abscess		1	1

Graph 1: representing the etiologies of ascites in the above patients.