

REASON ANALYSIS FOR ASCITES AMONG ADULT POPULATION ADMITTING IN THE EMERGENCY AND MEDICAL WARDS IN TERTIARY CARE HOSPITALS IN PRAKASAM DISTRICT: A REVIEW ON PROGNOSIS AND OUTCOME

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Article Received on 20/08/2021

Article Revised on 09/09/2021

Article Accepted on 30/09/2021

ABSTRACT

Back Ground: Ascites is a late complication of cirrhosis that not only reduces the patient's quality of life but also is associated with a mean survival of the patients. Abdominal ultrasound examination plays a significant role in patients with ascites for assessing the size and the causes of ascitic fluid in the abdomen. **Methodology:** A cross sectional study was conducted on the ascites patients attended the emergency wards, male medical and female medical inpatient wards of Government General Hospital Ongole, Prakasam District mainly and also nearby existing private hospitals. Specific structured face to face interviews were conducted by using pre-tested questionnaire which was administered to a patient to obtain the information. With the Laboratory evidence, possible cause of ascites were identified and based upon the response to treatment, predictors of the prognosis also evaluated for ascites. **Results:** Out of 40 patients with ascites 50% were males and 62.5% were illiterate. All the patients have been suffering with pallor and oedema, thirty one (77.5%) patients developed jaundice, eighteen patients (45%) have abdominal scar and distended veins were noticed in six (15%) cases. Hepatomegaly was noticed in all the forty patients. Ascitic fluid analysis revealed that in twenty two (55%) cases the cell count was less than 250. Protein value of more than 3.2gm/dl was noticed in five (12.5%) cases. chronic liver disease with cirrhosis is the main cause for ascites (82%) followed by congestive heart failure which contributed 5%. One sample t statistics of ESR, Hemoglobin, Bilirubin SAAG, protein and ADA levels in ascitic Fluid shown significant association with ascites (P<0.05). **Limitations:** All the patients were admitted on emergency basis in the hospitals and anthropometric measurements were not done for most of the patients. **Conclusions:** Ascites cases attending to the hospitals mainly due to Chronic Liver Disease followed by cirrhosis which was because of many causes. There is a need to evaluate most common reason for chronic liver disease, the reason being insignificant association has found between alcoholism and chronic liver disease in this study. Further studies are required to find out the reasons for cirrhosis especially in females.

KEYWORDS: Cirrhosis, Serum-ascites albumin gradient, Hepatomegaly, Ultrasound Examination,

INTRODUCTION

Ascites (from Greek askites, "baglike") means accumulation of fluid in the peritoneal cavity.^[1] Ascites results from high pressure in the blood vessels of the liver (portal hypertension) and low levels of a protein called albumin.^[2] Ascites is a late complication of cirrhosis that not only reduces the patient's quality of life but also is associated with a mean survival of only two years from its onset.^[3] Ascites exists in three grades: Grade 1- mild, only detectable on ultrasound and CT; Grade 2- detectable with flank bulging and shifting

dullness; Grade 3- directly visible, confirmed with the fluid wave/thrill test.^[4]

Major cause of ascites are: Portal hypertension -Cirrhosis (75% of all cases), Congestive cardiac failure (3%), Budd-Chiari syndrome, Venocclusive disease; Hypoalbuminaemia -Nephrotic syndrome (1%), Protein-losing enteropathy, Malnutrition ;Malignancy (10%) - Including lymphomas, leukaemias, primary mesothelioma; Infection (2%) -Spontaneous bacterial peritonitis, Tuberculous peritonitis, Fungal (eg, candida, cryptococcus), Parasitic (eg, strongyloides,

entamoeba); Pancreatitis (1%).^[5] Non-alcoholic fatty liver disease (NAFLD) is now the commonest cause of chronic liver disease in many developed countries.^[6] Non-alcoholic steatohepatitis (NASH) is the most extreme form of NAFLD, and is regarded as a major cause of cirrhosis of the liver in developed countries.^[7]

Abdominal ultrasound examination plays a significant role in patients with ascites for assessing the size and the causes of ascitic fluid.^[8] The serum-ascites albumin gradient (SAAG) is probably a better discriminant than older measures (transudate versus exudate) for the causes of ascites.^[5] Routine complete blood count (CBC), basic metabolic profile, liver enzymes, and coagulation should be performed. Most experts recommend a diagnostic paracentesis to be performed if the ascites is new or if the patient with ascites is being admitted to the hospital. The fluid is then reviewed for its gross appearance, protein level, albumin, and cell counts (red and white). Additional tests will be performed if indicated such as microbiological culture, Gram stain and cytopathology.^[9]

Radiologic studies are useful in detecting small amounts of ascitic fluid as well as helpful in assessing the aetiology of ascites.^[10]

Ascitic fluid accumulates in cirrhosis patients as a transudate which is the result of increased portal pressure (>8 mm Hg, usually around 20mm Hg), e.g. due to cirrhosis, while exudates are actively secreted fluid due to inflammation or malignancy.^[11] Portal hypertension plays an important role in the production of ascites by raising the capillary hydrostatic pressure within the splanchnic bed.^[12] Portal hypertension apparently leads to an increase in nitric oxide levels and it mediates splanchnic and peripheral vasodilation. Hepatic artery nitric oxide synthetase activity is greater in patients with ascites than in those without ascites.^[13] Refractory ascites, that is ascites which cannot be mobilized by low sodium diet and maximal doses of diuretics (up to 400mg spironolactone or potassium canrenoate and 160mg furosemide per day), occurs in 5% of cirrhotic patients with ascites.^[15]

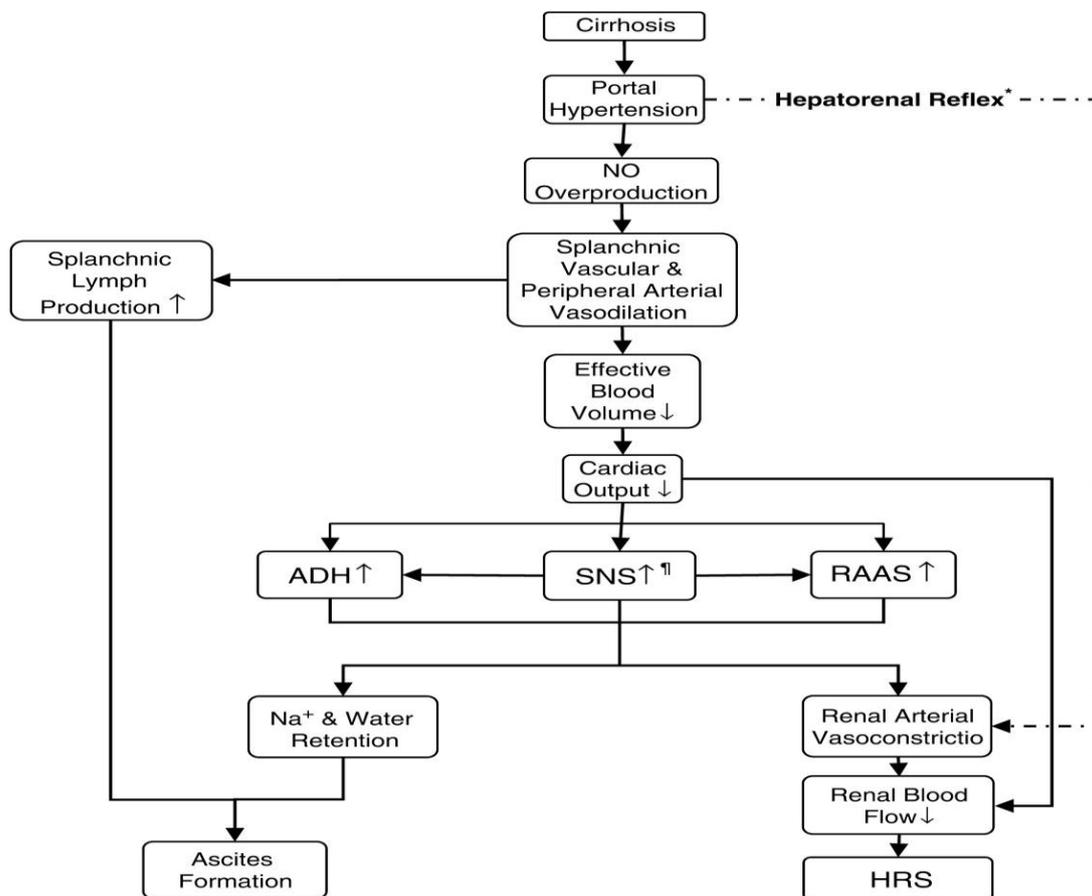


Figure 1^[14]: Pathophysiology of ascites according to peripheral arterial vasodilation hypothesis.

This study was aimed to find out the causes and factors for ascites among adult population and also to ascertain the prognostic predictors of the ascites taking into consideration sociodemographic, epidemiological, clinical and laboratory assessment.

METHODOLOGY

The study was conducted on the ascites patients attended the Emergency wards, male medical and female medical inpatient wards of Government General hospital Ongole, Prakasam District mainly and also nearby existing private hospitals. All the adult cases including males and females presenting with ascites to the hospitals attended

the participants of this study. Prior consent was taken from the private hospitals for doing survey on this study. Approval for this research was taken by the ethical committee to conduct the study. Descriptive cross-sectional study on all the patients with ascites above 18 years upto 75 years and a sample size of 40 Ascites cases admitted in the Governemnt General Hospital hospital and nearby private hospital were included in the study.

Inclusion criteria

1. Patients with ascites admitting in the male and female medical wards of Rajiv Gandhi Istitute of Medical Sciences and nearby private hospitals of Ongole, Prakasam District.
2. Patients with ascites between the age group of 18-75 years.

Exclusion criteria

1. Patients with ascites due to blunt injury abdomen, perforation and intra-abdominal bleeding.
2. Patients with minimal ascites on ultra-sound examination.
3. Patients with ascites due to Auto-immune hepatitis.
4. Patients with severe illness and not at all improving.

METHODS

Specific structured face to face interviews were conducted by using pre-tested questionnaire which was administered to a patient to obtain the information. Socio-demographic factors which causes ascites, personal habits of the patient who have ascites and also the past history of various infections, diseases were asked indetail. Patient's treatment history about the medicines, and Clinical evaluation of ascites and also prognostic factors determining ascites were also included in the study after examination and laboratory investigation by the concerned hospital doctors and their team. The prognosis was assessed by various blood examinations, Radiological examinations and different types of tests.

Details regarding patient's education, mother's education, father's education and their respective occupations were taken into consideration. If the patient is married, the spouse education and occupation and the patient's age at the time of marriage and their married life were also be asked. Patient's smoking history and alcohol history were be mainly taken in numbers and in quantity. History of drug abuse, blood transfusion, long forgotten percutaneous exposure, needle injury, blood products transfusion, injection of drugs, Haemodialysis, Intake of herbal teas or drinks and herbal products, Iron supplements, Household or sexual contact of a person with Hepatitis B, sexual exposure, inmates of correctional facility, chronic exposure to asbestosis, chronic mushroom consumption will be summed up for this study.

These patients were asked for lung related diseases, COPD, liver diseases especially Hepatitis B and C

infections, Heart diseases, Infections like STD, PID and nutritional status. The history of Tuberculosis, HIV/AIDS, Malignancy, chronic pancreatitis, Haemophilia, Mesothelioma and any other diseases were also contemplated. Particulars like obesity, Type 2 Diabetes Mellitus, Jejunoileal bypass, Medications, Nutritional status were also enlisted from the patients. Information regarding ATT therapy, ART for HIV/AIDS, received ISM medicines, consumption of medicinal foods for prolonged duration, prior treatment for presenting ascites, any prior treatment for conditions other than ascites, native and locally prepared medicine for jaundice and other local traditional practices for jaundice and ascites were gathered from the patient.

Chief complaints and presenting complaints to the hospitals were ascertained thoroughly. General examination for various signs and symptoms of ascites were done on all parts of the body from head to toe. Abdominal Examination for ascites was carried out for hepatomegaly, splenomegaly and other organ swelling and also for distended veins. Cardiovascular Examination and Respiratory Examination were done to find out the associated causes for ascites. Thyroid Examination for the swellings, Ophthalmic Examination for KF ring and Neurological Examination for signs of Hepatic encephalopathy were also performed.

All the relevant blood tests, liver tests, SAAG, Ascitic fluid analysis, viral markers, Radiological Examination like Chest X-ray, Ultrasound, 2D-ECHO and also ECG were tested. Renal Function Tests were assessed to review the kidney functions. After analysing and reviewing the various socio-demographic factors, Epidemiological factors, family history, treatment history the prognosis of the disease were assessed. By reviewing the presenting complaints, all the systemic examinations along with the Laboratory evidence, possible cause of ascites were identified and based upon the response to treatment predictors of the prognosis also evaluated for ascites.

Data Analysis: The data which will be gathered through the proforma cum questionnaire was entered in a data entry sheet after assigning the names to the variables. SPSS (Statistical Package for Social Sciences) or EPI-INFO-7 statistical software was used for the data analysis. Ascites is a outcome factor/ dependent variable. The causes and prognostic predictors which were causing ascites was the independent variable. Socio-demographic, Epidemiological factors and it's relation with the ascites was tested by Chi-square test. Prediction of death will be evaluated by univariate ANOVA Parametric test.

RESULTS

This study was carried out in 40 patients with ascites and among them 50% waere males and 50% were females. Twenty five patients (62.5%) were illiterate and nine patients (22.5%) have studied upto high school. Thirty

four patients (85%) belong to the nuclear family, 25% are involved in daily labour work, 15% are farmers and 30% are house wives (Table-1).

Table 1: Demographic factors of Study Participants.

S.No	Demographic factors	Variable	(N=40)	Percentage
1	Sex	Male	20	50
		Female	20	50
2	Education	Illiterate	25	62.5
		Primary and High School	11	27.5
		Inter and Degree	4	10
3	Type of Family	Nuclear	34	85
		Joint	6	15
4	Occupation	Labourer	10	25
		Farmers	6	15
		House wives	12	30
		Others	12	30

Out of total patients, fourteen were smokers and among them three (21.4%) smoked less than ten cigars per day, eleven (78.6%) smoked more than 10 cigars per day. Fifteen patients (37.5%) have a history of chronic alcoholism, among them fourteen patients (35%) have taken more than 185ml per day. Only three people (7.5%) have the history of chewing tobacco in their life

time. Among these patients three (7.5%) patients have suffered with tuberculosis, four (10%) patients were already diagnosed to have AIDS and two patients (5%) are having type-2 Diabetes mellitus. Five patients (12.5%) got treated for jaundice from local medical practitioners and fifteen patients (37.5%) received prior treatment for ascites (Table-2).

Table 2: Personal and Past History of Study Participants.

S.No	Personal and Past history	Variable	Number(N=40)	Percentage
1.	Smokers	More than ten per day	11	27.5
2	Tobacco chewing	Non tobacco chewers	37	92.5
3	Alcoholic consumption	More than 185ml per day	14	35
4	Tuberculosis	Without tuberculosis	37	92.5
5	AIDS	Without AIDS	36	90
6	Type-2 Diabetes mellitus	Without diabetes	38	95
7	Treatment for jaundice	Not received	35	87.5
8	Prior treatment for ascites	Not received	25	62.5

All the patients have been suffering with pallor and oedema, thirty one (77.5%) patients developed jaundice, eighteen patients (45%) have abdominal scar and distended veins were noticed in six (15%) cases. It was also noticed that twenty patients were moderately built and twenty patients are ill built. Hepatomegaly was noticed in all the forty patients and splenomegaly was noticed in seventeen patients (42.5%), per abdominal

mass and tenderness was noticed in all the forty patients. It was also observed that twenty six patients (65%) were having shifting dullness and fourteen patients (35%) have fluid thrill on abdominal examination. On auscultation, abdominal bruits were noticed in fifteen cases (37.5%). On ophthalmic fundus examination, K-F ring was noticed in one patient (2.5%) which was a significant finding in Wilson's disease (Table-3).

Table 3: Clinical Symptoms and Signs of Study Participants.

S.No	Clinical evaluation of ascites patients	Variable	Number(N=40)	Percentage
1	Jaundice	With jaundice	31	77.5
2	Abdominal scar	With scar	18	45
3	Distended veins	With distended veins	6	15
4	Built	Ill built	20	50
5	Splenomegaly	With splenomegaly	17	42.5
6	Shifting dullness	Present	26	65
7	Fluid thrill	Present	14	35
8	Abdominal bruits	Heard	15	37.5
9	K-F ring	Seen	1	2.5

It was observed that only three patients (7.5%) have an E.S.R of less than 20 and rest of the patients have more

than this value with mean of 31.975 which indicates that chronic infection exists in these patients. Hb level of less

than 7 was noticed among eight (20%) ascitic patients which is very low. It was also noticed that twenty one(52.5%) patients were having Hb between 7-

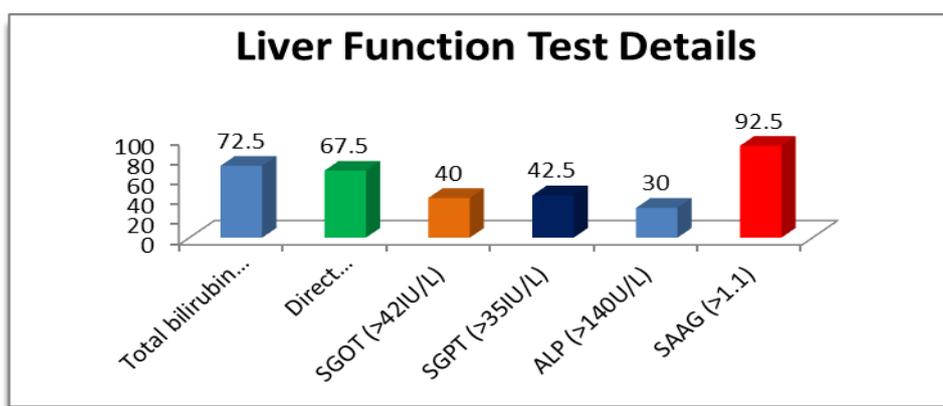
10gm. Only eleven patients(27.5%) have the Hb value of more than 10gm (Table-4).

Table 4: Haemogram Status in Study Participants.

S.No	Hemogram	Variables	Number(N=40)	Percentage
1	E.S.R	Less than 20	3	7.5
		More than 20	37	92.5
2	Hb	Less than 7	8	20
		Between 7-10	21	52.5
		More than 10	11	27.5

The study revealed that twenty nine (72.5%) patients are having a total bilirubin value of more than 1.2 and twenty seven patients (67.5%) have shown a direct bilirubin value of more than 0.3. The mean value of total bilirubin was 2.99 and direct bilirubin was 0.96. The liver enzyme levels mainly SGOT levels were higher than 42 IU/L in sixteen patients and SGPT value of more

than 35 IU/L was noticed in seventeen patients(42.5%). ALP value of more than 140U/L was noticed in twelve patients. A/G ratio was found to be normal in all patients and SAAG value of more than 1.1 was noticed in thirty seven(92.5%) patients. This indicates that most of the ascites cases were due to alcoholic and vascular causes (Graph-1).



Graph-1: Liver Function Details of Study Participants.

All the cases of ascites were diagnosed by U/S examination and shown ascitic fluid in the peritoneum. It was also observed that hepatosplenomegaly was seen in nine cases. Ascitic fluid analysis revealed that in twenty two (55%) cases the cell count was less than 250. Protein value of more than 3.2gm/dl was noticed in five(12.5%) cases and sugar value of more than 50mg/dl was observed in all forty cases. It was also found that ADA

levels of more than 40U/L was seen in only two (5%) cases which indicates that ascites is mainly non-tubercular. Albumin levels of less than 3.2 were noticed in all the patients. So this excludes the spontaneous bacterial peritonitis. Serum Amylase level was higher in one case. This study also found that out of forty cases four were suffering with HIV/AIDS, one was suffering with HCV and one with HbsAg (Table-5).

Table 5: Ascetic Fluid Analysis in Study Participants.

S.No	Ascitic fluid analysis of ascites patients	Variable	Number(N=40)	Percentage
1	Cell count	Less than 250	22	55
		More than 250	18	45
2	Protein	Less than 2.5 gm/dl	32	80.0
		More than 2.5 gm/dl	5	20.0
3	ADA	Less than 40U/L	38	95
		More than 40U/L	2	5

Chest x-ray was done in all the forty patients and it was normal in thirty three (82.5%) cases and pleural effusion was observed in six (15%) cases and one(2.5%) was suffering with cardiomegaly. ECG also revealed that thirty six (90%) patients were normal and four (10%)

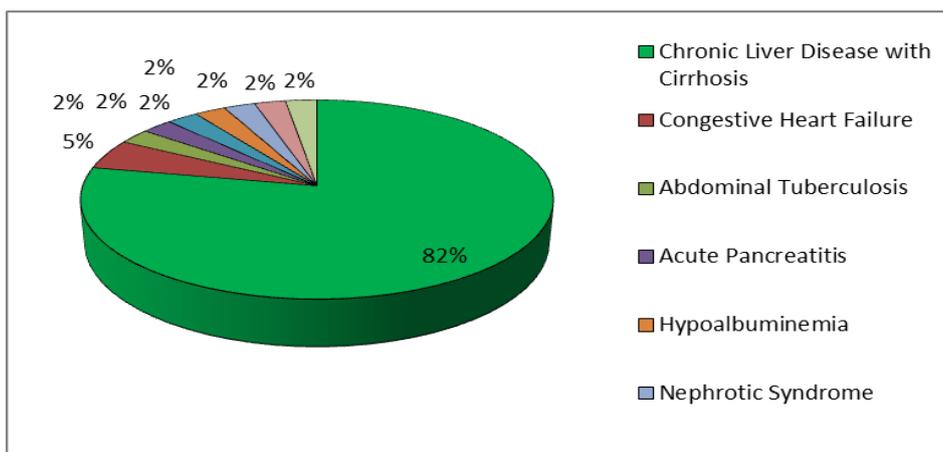
were having tachycardia. 2D-ECHO was done in three cases and were found to have heart problems. Serum creatinine was found to be more than 1.2mg/dl in twenty five (62.5%) patients and blood urea was found to be more than 24mg/dl in six (15%) patients (Table-6).

Table 6: Ascetic Fluid Analysis in Study Participants.

S.No	Investigations	Variable	Number(N=40)	Percentage
1	Chest x-ray	Normal	33	82.5
		Pleural effusion	6	15
		Cardiomegaly	1	2.5
2	ECG	Normal	36	90
		Tachycardia	4	10
3	Serum creatinine	Less than 1.2mg/dl	15	37.5
		More than 1.2mg/dl	25	62.5
4	Blood urea	Less than 24mg/dl	34	85
		More than 24mg/dl	6	15

After detailed and thorough review it was found that Chronic liver disease with cirrhosis is the main cause for ascites (82%) followed by Congestive heart failure which

contributed 5% and rest of the causes were abdominal Tuberculosis, Acute Pancreatitis, Hypoalbuminemia, Nephrotic syndrome, SLE and Wilson disease (Graph-2).



Graph-2: Reason Analysis of Ascites cases.

Relation between the alcoholism and provisional diagnosis has revealed that there is no significant relation between them and P value was 0.207 (Table-7).

Table-7: Relationship between alcohol and various provisional causes of ascites.

Variable	Provisional causes (P=0.207)								Total
	TB	Pancreatitis	CLD	CHF	Hy alb	NS	SLE	Wilson	
N	1	1	1	0	1	1	1	1	25
Y	0	0	2	2	0	0	0	0	15
Total	1	1	3	2	1	1	1	1	40

Relation between sex of the patients and chronic liver disease was found to be significant the P value was less than 0.05 (Table-8).

Table- 8: Association between sex and chronic liver disease.

		Chronic Liver Disease		Total
		Y	N	
Sex	M	19	1	20
	F	14	6	20
	Total	33	7	40
Chi square value =4.329, P value=0.037				

One sample t statistics of ESR, Hemoglobin, Bilirubin SAAG, protein and ADA levels in ascetic Fluid shown significant association with ascites (Table-9).

Table 9: Association of different investigations and ascites.

One-Sample Statistics									
	N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)	Mean Difference	95%
ESR	40	31.975	16.9153	2.6745	11.955	39	.000	31.9750	26.565
HAEMOGLOBIN	40	8.853	1.9591	.3098	28.579	39	.000	8.8525	8.226
Total Bilurubin	40	2.998	2.8558	.4515	6.638	39	.000	2.9975	2.084
Direct Bilurubun	40	2.055	1.9344	.3059	6.719	39	.000	2.0550	1.436
SAAG	40	1.710	.5956	.0942	18.157	39	.000	1.7100	1.520
Protein in Ascitic fluid	40	1.8088	.88755	.14033	12.889	39	.000	1.80875	1.5249
ADA levels in Ascitic Fluid	40	13.460	10.1247	1.6008	8.408	39	.000	13.4600	10.222

DISCUSSION

Ascites development is associated with a mortality of 50% within two years of diagnosis and once ascites becomes not responding to medical therapy, 50% of the patients die within six months.^[16] The onset of ascites is an important landmark in the natural history of cirrhosis. Adequate management of ascites is important, not only because it improves quality of life in patients with cirrhosis, but also prevents serious complication. Ascites is a common clinical problem, which can be a result of liver cirrhosis, neoplasm, tuberculous peritonitis, pyogenic peritonitis, congestive heart failure, nephrosis and pancreatic disorders.^[17]

In our study ultrasound examination of the abdomen was clearly shown that all 40 patients were having a ascites and this is mainly (82%) because of a Chronic Liver Disease and Cirrhosis after that Congestive heart failure (5%) but in Chu CM et al study it was found that the main reason for ascities was malignancy (68%), then tuberculosis peritonitis (20.2%) then followed by cirrhosis of liver (5.8%).^[18] According to Uddin etal study, among the causes of ascites, cirrhosis of liver accounted for 68%, followed by tubercular peritonitis 12%, nephrotic syndrome 8%, and congestive cardiac failure 6%.^[19] These findings were similar to our study. One more study revealed that the most common causes of ascites of unknown origin were malignancies (40.3%), cirrhosis (16.7%), and tuberculosis peritonitis (12.9%).^[20]

High serum/ascites albumin gradients (SAAG) values indicate higher levels of portal hypertension, which is because of Cirrhosis or a Heart failure. In the present study SAAG values of more than 1.1 was observed in 92.5% ascites cases which clearly indicates that these were occurred mainly because of cirrhotic and vascular origin and not because of infectious causes. A study conducted by M Beg etal in JN Medical College Aligarh revealed similar findings about SAAG, and these levels were found to me more than 1.1 among 76% of studied patients.^[21]

The traditional classification of ascites into 'exudative' and 'transudative' involves estimation of ascitic fluid total protein (AFTP), which is high ≥ 2.5 gm/dL in exudate and < 2.5 gm/dL in transudate. It was observed in our study that 80% of the patients were shown AFTP

of less than 2.5 gm/dl. In the same Aligarh study it was noticed that Ascitic fluid total protein were significantly lower in the cirrhotic patients and sometimes this value may not significant as that of Serum Ascites Albumin Gradient (SAAG).^[22]

ADA has been proposed to be a useful surrogate marker for the diagnosis of tuberculosis (TB) because it can be detected in body fluids such as pleural, pericardial, cerebrospinal fluid and peritoneal fluid and elevated ADA levels have been reported in these cases. It was observed in the study that 95% of the patients were below the cut off level of 40 IU/L which is significantly these ascites cases were not due to tubercular etiology. We observed only one case of ascites with the tubercular origin in that ADA levels are significantly elevated.^[23,24]

This study revealed was that there was no significant association between alcoholism, smoking Hepatitis and other factors with the Cirrhosis which is causing a ascites in this area and there might be some other unknown factor which causing cirrhosis in this area which needs further evaluation and research work. Regular evaluation of SAAG and Ascitic Protein and ADA level will be helpful in diagnosis and prognosis of the Chronic liver diseases. low serum albumin is an independent prognostic prognostic factor..

Among the total patients 62% were illiterate most of them were involved in daily labour work and farming. Among them 35% were smokers, 37.5% were alcoholics. It was clearly observed that Ultrasound examinations of abdomen that all the patient are having ascites. Most of them were anaemic and 72% were shown bilirubin of more than 1.2 and more than 40% of patients were shown high SGOT and SGPT levels, this clearly gives evidence that ascites causes are because of Chronic Liver Disease like Cirrhosis. X-Ray, ECG and ECHO were excluded the Pulmonary and cardiac causes of ascites.

CONCLUSIONS

Among the total cases 50% cases were females and there is a need to find unknown causes of ascites among them. The most common cause of ascites observed in this area was chronic liver disease with cirrhosis. There is a need to evaluate reasons for chronic liver disease, the reason being insignificant association has found between

alcoholism and chronic liver disease in this study. Serum Protein count was observed to be less than 2.5 in maximum number of patients. So this indicates that the particular disease is due to non-tuberculosis cause. Ascitic ADA level assessment tells about the prognosis. Further studies are required to find out the reasons for cirrhosis especially in females. The serum ascites albumin gradient value was found to be more than 1.1 in maximum number of patients. This indicates that hepatic, extra hepatic and vascular causes were the more common causes for ascites.

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