

API DELHI STATE CHAPTER 2022

DIAGNOSTIC VALUE OF SERUM ASCITIC LIPID GRADIENTS IN DIFFERENTIATION BETWEEN CIRRHOTIC, TUBERCULOUS AND MALIGNANT ASCITES

Presentor: Dr .SABARISH GANESAN

PG RESIDENT

Department of General Medicine

ABVIMS AND DR RML HOSPITAL, NEW

INTRODUCTION

- Pathological accumulation of fluid in peritoneal cavity is called ascites. Serum ascites albumin gradient (SAAG) has been used to categorize ascites based on different etiologies.
- A high SAAG(≥1.1gm%) is usually associated with increased portal pressure such as chronic liver disease and low SAAG(<1.1gm%) in conditions not related to portal hypertension such as tuberculous peritonitis, peritoneal malignancy, pancreatic ascites etc.,</p>
- Among low SAAG ascites, it is not possible to differentiate between etiologies such as malignancy or tuberculous ascites etc.,
- The present study was done to reveal the diagnostic utility of serum ascitic lipid gradients in differentiating cirrhotic, tuberculous and malignant ascites and comparing it with standard SAAG criteria to know whether it has higher yield.

1. To study the diagnostic value of serum ascitic lipid gradients in differentiation between Cirrhotic, Tuberculous

and Malignant Ascites.

2.To compare the efficacy of serum ascitic lipid gradients to serum ascitic albumin gradient in patients of

Cirrhotic, Tuberculous and Malignant ascites.

INCLUSION CLITERIA

- 1. Patients with ascites proven by ultrasound.
- 2. Patients with age 18 year and older.
- 3. Patients having cirrhosis of liver with ascites-clinical, biochemical and radiological investigations were suggestive of chronic liver disease and ultrasound showing coarse echotexture with surface nodularity of liver.
- 4. Patients with tuberculous ascites- ascitic fluid Adenosine Deaminase / Gene Xpert / AFB stain positive for *Mycobacterium Tuberculosis*.
- 5. Patients with malignant ascites- ascitic fluid for malignant cells / histopathological evidence of malignant tissue positive.

EXCLUSION CLITERIA

- 1. Patients having cirrhosis with spontaneous bacterial peritonitis.
- 2. Patients with nephrotic syndrome.
- 3. Patients with mixed causes of ascites (cirrhosis with tuberculosis, cirrhosis with malignancy).
- 4. Patients with heart failure.
- 5. Patients with chylous ascites.
- 6. Other cause of ascites like Budd Chiari Syndrome, malnutrition, pancreatitis, etc.

- Study Place: Department of Medicine, Atal Bihari Vajpayee Institute of Medical Sciences & Dr. Ram Manohar Lohia Hospital, New Delhi
- **Study Design:** Cross sectional observational study
- **Study Period:** 1st January, 2021 to 31st May, 2022.
- **Sample Size:** 100

All patients are subjected to:

1. Clinical evaluation (medical history and physical examination)

- 2. Complete hemogram
- 3. Abdominal ultrasonographic examination
- 4. Liver function tests including total protein and albumin.
- 5. Coagulation profile.
- 6. Serum lipid profile
- 7. Ascitic lipid profile and ascitic fluid albumin

- Diagnostic paracentesis was done with prior written consent using 20- 22 gauge 2.5 inch disposable needles under sterile precautions using Z track technique, Around 50 ml fluid was aspirated and fluid was immediately sent for biochemical analysis.
- Albumin, cholesterol, triglycerides and HDL levels will be measured in sera and ascitic fluid supernatants using automated analyser. LDL values will be calculated using Friedewald formula (LDL = TC-HDL-TG/5).
- Then serum-ascites gradient will be calculated using the formula: "Serum ascites X gradient=X concentration in serum-X concentration in ascitic fluid", where X refers to the substance of interest (E.g.- albumin or lipids)

STATISTICAL ANALYSIS

- Continuous parametric data was reported as Means and standard deviation while non-parameteric data was reported as median. Categorical data was reported in percentages.
- Comparison of categorical data between the two groups was done using Chi square test. Comparison of continuous data between two groups was done using independent t-test and between more than two groups was done using one-way ANOVA.
- Correlation between continuous variables was done using Pearson correlation coefficient.
- A receiver operating characteristics curve was constructed to identify ideal cut-off values for serum ascites marker gradient and ascitic fluid parameters and subsequently assess the diagnostic validity.
- ▶ p value of less than 0.05 was considered to be statistically significant.

RESULTS

- ► The study included 100 patients.
- ▶ Male:62 and female:38.
- Mean age: 58.43 years

Diagnosis of the patient	No. of cases (%)
Cirrhotic liver disease (CLD)	44
Tubercular peritonitis (TBP)	35
Malignant ascites (MA)	21

Parameter	Diagnosis	Mean (SD)	Median (IQR)
Total protein	CLD	1.01 (0.14)	1.04 (0.85 - 1.11)
	TBP	4.05 (1)	4.1 (3.5 - 4.9)
	MA	4.61 (0.38)	4.63 (4.23 - 5)
	CLD	0.48 (0.08)	0.49 (0.45 - 0.5)
Albumin	TBP	2.36 (0.45)	2.3 (1.92 - 2.78)
	MA	2.42 (0.23)	2.45 (2.19 - 2.6)
	CLD	14.46 (1.64)	14.06 (12.9 - 15.7)
Total Cholesterol	TBP	65.33 (11.84)	65.2 (55.6 - 78.9)
	MA	88.31 (13.88)	91 (77.65 - 101.5)
	CLD	34.19 (6.86)	34.5 (27.87 - 40.87)
Triglyceride	TBP	59.49 (9.41)	59.6 (50.5 - 67.2)
	MA	48.23 (12.95)	40.5 (36.85 - 61.4)
	CLD	4.92 (1.25)	5.39 (3.97 - 5.69)
HDL	TBP	9.1 (3.75)	9.5 (5.8 - 12.3)
	MA	21.6 (3.76)	21.5 (18.4 - 25)
	CLD	5.65 (1.52)	6.14 (4.52 - 6.71)
LDL	TBP	44.17 (11.34)	44.7 (37 - 52.7)
	MA	54.58 (13.04)	55.2 (40.85 - 66.7)

ASCITIC FLUID PARAMETERS

AF	p-value				
parameters	Overall	CLD vs TBP	CLD vs MA	TBP vs MA	
Cotal protein	0.001	0.001	0.001	0.075	
Albumin	0.001	0.001	0.001	0.719	
Total	0.001	0.001	0.001	0.001	
cholesterol					
`riglyceride s	0.001	0.001	0.001	0.001	
HDL	0.001	0.001	0.001	0.001	
LDL	0.001	0.001	0.001	0.001	

Parameter	Diagnosis	Mean (SD)	Median (IQR)		
	CLD	2.15 (0.42)	2.1 (1.88 - 2.4)		
SA albumin	TBP	1.06 (0.44)	1.02 (0.74 - 1.33)		
gradient	MA	0.92 (0.43)	1 (0.74 - 1.22)		
			102.1 (89.15 -		
SA cholesterol	CLD	101.24 (13.8)	112.94)		
gradient	TBP	71.66 (16.26)	68.7 (59.8 - 80.8)		
	MA	77.16 (15.46)	75.5 (65.35 - 90.8)		
	CLD	75.43 (17.08)	77 (64.9 - 87.4)		
SA triglyceride	TBP	88.38 (23.14)	91.2 (76.8 - 102)		
gradient	MA	86.9 (27.09)	89.6 (63.05 - 108.9)		
SA HDL	CLD	14.56 (4.98)	14.55 (11.54 - 15.87)		
gradient	TBP	8.44 (5.68)	6.8 (4.9 - 13)		
	MA	8.71 (3.58)	7.6 (5.85 - 11.55)		
SA LDL	CLD	51.17 (11.5)	50.58 (41.69 - 58.62)		
gradient	TBP	31.05 (12.37)	30.9 (20.5 - 42.7)		

SAG	p-value				
parameters	Overall	CLD vs TBP	CLD vs MA	TBP vs MA	
SA albumin	0.001	0.001	0.001	0.496	
gradient					
SA	0.001	0.001	0.001	0.386	
cholesterol					
gradient					
SA	0.021	0.027	0.121	0.967	
triglyceride					
gradient					
SA HDL	0.001	0.001	0.001	0.979	
gradient					
SA LDI.	0.001	0.001	0.001	0.06	
SA LUL	0.001	0.001	0.001	0.00	
gradient					



POST HOC ANALYSIS

parameter	AUC	Ideal Cut-off value	Sensitivity	Specificity	PPV	NPV	Diag accuracy
SAAG	0.973	1.1	96%	80.4%	80.3%	90%	89.0%
SA Cholesterol	0.901	81.11	93.0%	71.4%	71.9%	92.8%	80.9%
SA TG	0.317	70.90	60.5%	25.0%	38.8%	44.6%	40.6%
SA HDL	0.808	10.80	90.7%	66.1%	67.8%	90.0%	76.9%
SA LDL	0.821	43.24	72.1%	71.4%	66.4%	76.5%	71.7%
AF Protein total	0.982	2.50	73%	56%	77%	69%	43.2%

DISCUSSION

- Ascites due to tuberculosis and malignancy have similar presentation and tumour markers such as CA125 ,CEA have overlapping results . Malignant fluid cytology has very low sensitivity of only 64%. Most of the time, diagnosis is not possible without invasive and expensive investigations like CT abdomen, biopsy and FNAC of peritoneal nodes and diagnostic laparotomy/ laparoscopy.
- The study revealed the following observations:
- I.SAAG is a superior marker in differentiating ascites with portal hypertension to ascites without portal hypertension (TB ascites, malignant ascites etc.,) than ascitic fluid total protein.
- 2.Serum Ascitic Lipid Gradient (SALG) has good sensitivity, specificity and diagnostic accuracy in differentiating cirrhotic from noncirrhotic ascites.

- 3.SALG cannot differentiate between tuberculous and malignant ascites. Serum ascitic LDL gradient showed promising result in differentiating tuberculous and malignant ascites(p=0.06), but not statistically significant.
- 4.Ascitic fluid total cholesterol, HDL and LDL were able to differentiate between tuberculous and malignant ascites, but needs further studies for validation of results.

CONCLUSION

- ▶ There is a need for simple test to differentiate various causes of ascites.
- In our study, SAAG was found to be superior marker in differentiating ascites due to portal hypertension from other causes.
- Serum ascitic lipid gradient can differentiate between cirrhotic and non cirrhotic ascites but not between malignant and TB ascites
- Ascitic fluid total cholesterol, HDL,LDL can differentiate between TB and malignant ascites but needs further studies for validation.

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Mukhyaprana Prabhu, Rahul sai Gangula and Weena Stanley,"Diagnostic Utility of serum ascitic lipid and

"THANK YOU"