

Study Of Diagnostic Significance Of Serum Lipid Gradients (SALG) In Differentiation Of Ascites From Liver Cirrhosis , Malignancy And Tuberculosis.

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Abstract:

Aims: To study the significance of serum ascites lipid gradient (SALG) for total cholesterol, triglyceride, HDL cholesterol, LDL cholesterol and VLDL cholesterol in differentiation of ascites due to cirrhosis of liver and ascites due to malignancy and tuberculosis.

Material and methods: A study on 50 patients admitted at R.N.T. Medical college and MBG Hospital Udaipur admitted with ascites was carried out. The patients were classified as cirrhotic, tubercular and malignant on the basis of history, physical examination, USG and biochemical and cytological investigations. Biochemical examination of ascitic fluid for protein, albumin, cholesterol, LDL, HDL, VLDL, and triglyceride was estimated. SALG was calculated by subtracting serum total cholesterol, triglyceride, VLDL, HDL and LDL from ascitic cholesterol, triglyceride, VLDL, HDL and LDL respectively.

Results: 32% of cases belonged to age group 41-50 years. A male predominance was observed in the study with a ratio of 16:9. Maximum incidence of malignant ascites was observed in the age group of 41-50 years and more than 50 years. In all patients of ascites belonging to group of cirrhosis serum lipid profile was found lower than the patients of malignancy and tuberculosis and value of ascitic fluid lipid profile for total cholesterol, triglyceride, HDL cholesterol, VLDL cholesterol, and LDL cholesterol were also low. Values were highly significant in cirrhosis and malignant group (C Vs M < 0.001) and cirrhosis and tuberculosis group (C Vs T < 0.001), while it is not significant between malignant and tubercular group. Statistical analysis shows that the value of SALG for cholesterol, triglyceride, VLDL cholesterol, was significant between cirrhotic and malignant group (C Vs M < 0.005) and highly significant between cirrhotic and tubercular group (C Vs T < 0.001). SALG for HDL cholesterol was highly significant between cirrhotic and malignant group (C Vs M < 0.001) and cirrhotic and tubercular group (C Vs T < 0.001) while SALG for LDL cholesterol was significant between cirrhotic and malignant group (C Vs M < 0.05) and cirrhotic and tubercular group (C Vs T, 0.05). **Conclusion:** Measurement of serum ascites lipid gradient can be used as alternate and additive to serum ascites albumin gradient in differential diagnosis of ascites.

Key Words: SALG, Ascites, Cirrhosis, Malignancy, Tuberculosis.

I. Introduction

Ascites is the pathological fluid accumulation of fluid in the peritoneal cavity¹. In causation of ascites parenchymal liver disease is more frequent but other diseases like malignancy, tuberculosis, heart failure, nephrotic syndrome and pancreatitis are also involved. The clinical diagnosis of ascites is easy but to detect its etiology is a challenge. The diagnosis of etiology of ascites is based on history, physical examination and ascitic fluid analysis. The appearance, colour, cytological examination, total protein including albumin, specific gravity and measurement of serum ascites albumin gradient (SAAG) have been used to study the etiology of ascites. Number of authors found that SALG of ascitic fluid can also be used to differentiate between transudative and exudative causes. As there are only a few studies reported in literature regarding the diagnostic significance of SALG in differentiation of ascites from cirrhosis, malignancy and tuberculosis, so this study was planned to evaluate the role of SALG in d/d of various types of ascites.

Aims and Objectives:

To study the significance of serum ascites lipid gradient (SALG) for total cholesterol, triglyceride, HDL cholesterol, LDL cholesterol and VLDL cholesterol in differentiation of ascites due to cirrhosis of liver and ascites due to malignancy and tuberculosis.

II. Material And Methods

A study on 50 patients admitted at R.N.T. Medical college and MBG Hospital Udaipur admitted with ascites was carried out. The patients were classified as cirrhotic, tubercular and malignant on the basis of history, physical examination, USG and biochemical investigations. On obtaining history of abdominal distension, physical findings of ascites was confirmed by eliciting puddle sign (150 ml or less), shifting dullness (>1.5-2 litres) or fluid thrill (>4.5 litre) USG was done in all patients to confirm ascites and detect other abnormal findings. Routine investigations CBC, ESR, urine sugar, Xray chest PA view, blood glucose, lipid profile, renal and liver function test was done in all patients. Ascitic fluid was tapped by amniocentesis and sent for examination. Physical examination like colour (clear and colourless-normal, cloudy in bacterial infection, bloody in traumatic tap, tubercular, malignant or pancreatic ascites., milky in high lipid content.) and specific gravity (<1.016 in transudate and >1.016 in exudates) were evaluated. Microscopic examination like WBC (WBC>500cummm s/o bacterial inflammation), lymphocyte (high lymphocyte % s/o of TB, lymphoma, cancer or viral infection) and cytological examination for malignant cells was done. Biochemical examination of ascitic fluid for protein, albumin, cholesterol, LDL, HDL, VLDL, and triglyceride was estimated. SAAG was calculated by subtracting serum albumin from ascitic albumin. SALG was calculated by subtracting serum total cholesterol, triglyceride, VLDL, HDL and LDL from ascitic cholesterol, triglyceride, VLDL, HDL and LDL respectively.

Observation:

Table 1 : Age and Sex wise distribution of the Three Groups

Age	10-20years		21-30years		31-40years		41-50years		More than 50years		Total	%
Sex	M	F	M	F	M	F	M	F	M	F		
Cirrrosis	-	1	1	2	5	1	2	2	6	-	20	40
Malignant	-	-	1	-	2	1	4	4	6	2	20	40
Tubercular	2	2	-	-	-	1	3	1	-	1	10	20
Total	5		4		10		16		15		50	100
%	10%		8%		20%		32%		30%		100%	

32% of cases belonged to age group 41-50years. A male predominance was observed in the study with a ratio of 16:9. Maximum incidence of malignant ascites was observed in the age group of 41-50 years and more than 50 years. No malignant case found below age of 21 years.

Table 2 Serum cholesterol(mg%), Triglyceride (mg%), HDL cholesterol (mg%), LDL cholesterol (mg%), and VLDL cholesterol (mg%) in the three groups.

Serum Lipid Profile	Cirrrosis(C) (n=20)	Malignancy (M) (n=20)	Tuberculosis (T) (n=10)
cholesterol(mg%)	113.68 ± 39.84	149.65 ± 11.69	142.40 ± 15.15
Triglyceride (mg%)	74.84 ± 26.43	98.10 ± 14.82	104.40 ± 32.64
HDL cholesterol (mg%)	30.07 ± 6.55	46.90 ± 7.83	41.50 ± 5.13
LDL cholesterol (mg%),	68.05 ± 35.39	80.95 ± 10.45	78.30 ± 9.18
VLDL cholesterol (mg%)	15.15 ± 5.16	19.50 ± 2.89	22.80 ± 6.53

In all patients of ascites belonging to group of cirrhosis serum lipid profile was found lower than the patients of malignancy and TB.

Table 3: Ascitic fluid cholesterol (mg%), Triglyceride (mg%), HDL cholesterol (mg%), LDL cholesterol (mg%), and VLDL cholesterol (mg%) in the three groups.

Ascitic fluid Lipid Profile	Cirrrosis(C) (n=20)	Malignancy (M) (n=20)	Tuberculosis (T) (n=10)	P value
cholesterol(mg%)	26.40 ± 20.33	104.20 ± 12.24	97.80 ± 13.38	C Vs M<0.001 C Vs T <0.001 M Vs T NS
Triglyceride (mg%)	22.01 ± 10.17	48.25 ± 7.48	57.00 ± 12.74	C Vs M<0.001 C Vs T <0.001 M Vs T NS
HDL cholesterol (mg%)	9.12 ± 8.50	36.45 ± 6.57	30.00 ± 6.86	C Vs M<0.001 C Vs T <0.001 M Vs T NS
LDL cholesterol (mg%),	12.46 ± 12.19	58.80 ± 13.02	56.60 ± 11.64	C Vs M<0.001 C Vs T <0.001 M Vs T NS
VLDL cholesterol (mg%)	4.41 ± 2.32	9.70 ± 1.49	11.20 ± 2.20	C Vs M<0.001 C Vs T <0.001 M Vs T NS

The ascitic fluid lipid profile for total cholesterol, triglyceride, HDL cholesterol, VLDL cholesterol, and LDL cholesterol was found lower in cirrhotic group than malignant and tubercular group. In the cirrhotic group it was 26.40±20.33, 22.01±10.17, 9.12±8.50, 12.46±12.19, 4.41±2.32. Statistical analysis of these values are helpful in differentiating cirrhotic from malignant and tubercular group. As value of ascitic lipid profile for total cholesterol, triglyceride, HDL cholesterol, VLDL cholesterol, and LDL cholesterol were highly significant in cirrhosis and malignant group (C Vs M < 0.001) and tuberculosis (C Vs T <0.001) while it is not significant between malignant and tubercular group.

Serum ascites cholesterol gradient, serum ascites triglyceride gradient, serum ascites HDL cholesterol gradient, serum ascites LDL cholesterol gradient and serum ascites VLDL cholesterol gradient in three groups.

Table 4

Serum ascitic Lipid gradient	Cirrrosis{ C} (n=20)	Malignancy{M} (n=20)	Tuberculosis {T}(n=10)	P value
cholesterol(mg%)	87.26 ± 45.87	42.45 ± 21.71	44.60 ± 21.71	C Vs M <0.05 C Vs T <0.001 M Vs T NS
Triglyceride (mg%)	62.84 ± 27.24	46.50±21.86	46.50±21.86	C Vs M <0.05 C Vs T <0.001 M Vs T NS
HDL cholesterol (mg%)	20.99 ± 8.75	9.52 ± 4.82	11.50 ± 4.86	C Vs M <0.001 C Vs T < 0.001 M Vs T NS
LDL cholesterol (mg%),	56.49 ± 37.45	26.60 ± 13.97	21.80 ± 15.10	C Vs M <0.05 C Vs T <0.05 M Vs T NS
VLDL cholesterol (mg%)	16.45 ± 5.72	9.80 ± 2.55	9.60 ± 4.72	C Vs M <0.05 C Vs T < 0.001 M Vs T NS

In all patients of ascites due to cirrhosis SALG for cholesterol, Triglyceride, HDL cholesterol, LDL . cholesterol, VLDL cholesterol was higher than patient of malignant and tubercular ascites. It was 87.26±45.87,62.84±27.24, 20.99±8.75, 56.49±37.45, 16.54±5.72 respectively. Statistical analysis shows that the value of SALG for cholesterol, triglyceride, VLDL cholesterol, was significant between cirrhotic and malignant group (C Vs M<0.05) and highly significant between cirrhotic and tubercular group (C Vs T <0.001) . SALG for HDL cholesterol was highly significant between cirrhotic and malignant group (C Vs M <0.001) and cirrhotic and tubercular group (C Vs T <0.001) while SALG for LDL cholesterol was significant between cirrhotic and malignant group (C Vs M <0.05) and cirrhotic and tubercular group (C Vs T <0.05).

III. Discussion:

Ascites is the accumulation of excess fluid in peritoneal cavity. It is a common clinical manifestation of various systemic and intra abdominal disorders, most frequently it occurs in patients with cirrhosis, malignancy and tuberculosis. Simple classification of ascites on the basis of exudates or transudate leads to many erroneous diagnosis as pointed in many studies (Sampliner² 1974, Thomas D Boyer ³1978).

In our study 50 patients of ascites were included, out of them 32(64%) were male and 18(18%) were female. 20(40%) were cirrhotic, 20(40%) were had malignancy and 10(20%) were tubercular. In cirrhotic group 14 patients were male and 6 were female. In malignant group the distribution of male and female were 13 (65%) and 7 (35%) respectively. Similarly in tubercular group male and female patient were 5 (50%) each. 50% patients in cirrhotic group were in the age group of 31-50 years, whereas 16 (80%) cases of malignant ascites were observed to be in the age group above 41 years.

Gupta et al ⁴(1995) Sharatchandra et al⁵(2005) emphasised on the role serum ascites lipid gradient in differential diagnosis of ascites. In chronic liver disease , abnormality in serum lipoprotein can result from multiple mechanism such as decreased synthesis of lipoprotein, decreased clearance of lipoprotein complex by liver and regurgitation of biliary contents into serum. So in chronic liver disease it was found that serum lipid profile was usually lower than normal especially for total cholesterol, LDL and HDL (Sleisenger, 2002)¹. On the other hand in ascites due to malignancy increased cholesterol level may be attributed increased vascular permeability, release from neoplastic cells, increased cholesterol synthesis and relative blocking of peritoneal lymphatic drainage which may result in sequestration of cholesterol macromolecules in peritoneal cavity.

In the present study it was observed that both serum and ascitic lipid profile were lower in cirrhotic group than in malignant and tubercular group. Our findings were similar to observations made by Garg etal⁶(1993) who reported that mean ascitic cholesterol was significantly higher in malignant ascites (89.52%) as compared to non malignant ascites (29.93%). Alexander et al⁷ (1991) also reported that ascitic fluid cholesterol was high (>45%) in patients of malignancy. Jungst et al⁸ (1992) also found that mean value of total cholesterol,

HDL cholesterol, and LDL cholesterol in ascitic fluid were significantly higher in malignant group than in cirrhotic group.

In our study we found that SALG for total cholesterol, Triglycerides, LDL, HDL and VLDL cholesterol was high in patients of cirrhosis. It was 87.26 ± 45.87 , 62.84 ± 27.24 , 20.99 ± 8.75 , 56.49 ± 37.45 , 16.54 ± 5.72 respectively. Sharatchandra⁵ (2005) also found that SALG for cholesterol, Triglycerides, LDL, HDL and VLDL cholesterol was high in patients of cirrhosis than malignancy and tuberculosis.

In our study it was found that SALG can be used for differentiating between ascites due to cirrhosis and to malignancy and tuberculosis .

IV. Conclusion:

Measurement of serum ascites lipid gradient can be used as alternate and additive to serum ascites albumin gradient in differential diagnosis of ascites. Although there is no clear cut gradient for SALG, more studies are needed to calculate SALG to differentiate between ascites of various type.

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