



STUDY OF THE USEFULNESS OF ASCITIS FLUID CHOLESTEROL LEVEL IN DIFFERENTIATION OF MALIGNANT AND NON MALIGNANT ASCITIS

Gastroenterology

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ABSTRACT

Ascitic fluid cholesterol was estimated in 46 patients (16 malignant and 30 non malignant ascitis). The mean ascetic fluid cholesterol level was significantly higher in malignant ascitis (53.18±8.32 mg/dl) as compared to non malignant ascitis (34±6.76 mg/dl) and at a cut off value of 48 mg/dl; the sensitivity, specificity and diagnostic accuracy was higher for malignant ascitis. The ascetic fluid cholesterol estimation is a easy diagnostic test for differentiating malignant from non malignant ascitis.

KEYWORDS

Ascitic Fluid Cholesterol, Malignant Ascitis, Non Malignant Ascitis.

INTRODUCTION

Ascites is a common problem in medical practice and it is one of the cardinal manifestations of chronic liver disease or peritoneal pathology. Common causes of ascites are cirrhosis of liver, tubercular peritonitis, various malignancies and primary peritoneal pathology. Differential diagnosis of ascitis with relatively non invasive investigations is not very satisfactory and by conventional analysis of ascitic fluid, we are not able to diagnose malignancy with high accuracy, unless malignant cells could be demonstrated in ascitic fluid. Demonstration of malignant cells by exfoliative cytology yields high specificity but it is unreliable due to less sensitivity.¹ Other parameters studied are as pH, cell count, serum to ascitic fluid protein and albumin gradient but none has proved to be of diagnostic significance. Recently ascitic fluid cholesterol has been reported to offer an excellent discrimination between ascites due to liver disease and that caused by malignancy.^{2,3,4}

Hence the present study was performed to find out the diagnostic value of ascitic fluid cholesterol in prediction of malignant ascitis.

MATERIAL & METHOD

The present study was conducted on patients admitted in J.L.N. Medical College, Ajmer. The following study groups were made.

Group I - 30 patients of ascitis due to cirrhosis of liver (non malignant ascitis)

Group II - 16 patients of ascitis were due to various malignancies. (malignant ascitis)

The patients were evaluated clinically and complete hemogram. liver function test profile i.e. serum bilirubin, SGOT, SGPT, total protein, albumin / globulin ratio and alkaline phosphatase were done. The peritoneal fluid was analysed for cytology including extolative cytology for malignant cells, chemical examination i.e. ascitic fluid protein, glucose, cholesterol. The histopathological examination of peritoneal or other tissues (liver, lymphnodes) was done by biopsy after ultrasonography (USG).

The diagnosis of malignancy related ascites was made after USG, peritoneal tissue biopsy and histopathological examination. The serum and ascitic fluid cholesterol was estimated by Wybenga and Pillegi (1990) method⁵.

Absorbance of test

Total cholesterol in mg% = ----- x 200.

Absorbance of standard

A cut off value for each parameter was calculated by the following formula 6.

Cut off value = 2 x SD ± mean value of liver disease group.

The mean values were compared by unpaired, two tailed student's test and the results were expressed as mean ± SD. The various statistical values were calculated.

RESULTS:

Out of 30 patients in group I, 22 (73%) were male and 8(27%) were females. Amongst 16 patients of malignant ascites (Group II), 9 (56%) were males and 7(44%) were females. Mean age of group I patients was 48.53 ± 7.76 and group II was 57.38 ± 10.43 which is statistically not significant (Table I).

Table - I Age Range & Sex Distribution of Patients

Age (Years)	Group I (n = 30)		Group II (n = 60)	
	M	F	M	F
20-30	-	-	-	-
31-40	4	2	-	2
41-50	10	2	2	-
51-60	8	4	5	2
>60	-	-	2	3
Total	22	8	9	7
Mean Age	48.53 ± 7.76		57.38 ± 10.43	

The mean values of serum bilirubin, SGOT and SGPT was significantly higher in group I than those of group II while the mean values of serum total protein, serum albumin was significantly low in group I as compared to group II (Table II) 31.25% patients were of secondaries liver with peritoneal implant (Table III).

Table - II Liver Function Tests of Subjects Studied

Group	S.bilirubin mg/dl	SGOT IU	SGPT IU	Total Protein gm/100ml	Serum Albumin gm/100ml	Serum Globulin gm/100 ml
Group I	6.11±3.72	106.2±58.40	119.67±78.61	5.89±1.05	3.21±0.57	2.68±0.62
Group II	3.08±4.32	33.31±17.88	33.06±17.48	6.63±0.72	3.73±0.61	2.90±0.3
P Value	P<0.01	P < 0.001***	P < 0.001***	P < 0.01**	P < 0.01**	P>0.05

* Non Significant ** Very Significant*** Highly Significant

Table- III Etiological wise Distribution of Patients with Malignant Ascitis

Diagnosis	Male No. (%)	Female No. (%)	Total No. (%)
Carcinoma of gastrointestinal	1(6.25)	2(12.5)	3(18.15)
Secondaries of liver with peritoneal implant	5(31.25)	-	5(31.25)

Unknown tumor with peritoneal carcinomatosis	2(12.5)	1(6.25)	3(18.75)
Renal cell carcinoma with peritoneal implant	1(6.25)	1(6.25)	2(12.5)
Ovarian carcinoma with peritoneal implant	-	3(18.75)	3(18.75)

The ascitic fluid, total protein and the ascitic fluid protein and serum protein ratio was 1.71 ± 0.71, 0.30 ± 0.1 in non malignant and in

malignant it was 3.9 ± 1.04 , 0.58 ± 0.19 and it was found to have significant difference. Malignant cells were present in only 6 (37.5%) patients of group II (Table IV). There was significant difference ($P < 0.001$) in ascitic fluid cholesterol in group I and group II but there was no significant difference in mean ascitic fluid cholesterol in those who were positive for malignant cells and those who were negative. There was no significant difference in mean serum cholesterol of various groups studied (Table V). Taking the ascitic fluid cholesterol value at 48 mg/dl as cut off level, the sensitivity, specificity, and diagnostic accuracy was calculated. Ascitic fluid cholesterol value shows highest sensitivity, specificity and diagnostic accuracy. Although malignant cells positivity has 100% specificity but sensitivity and diagnostic accuracy were lower than those of ascitic fluid cholesterol (Table VI).

DISCUSSION

Differential diagnosis of ascitis remains a problem in clinical practice. The USG, CT Scan, MRI and tumor markers are not feasible in every case to differentiate between malignant and non malignant ascitis because of high cost. In previous studies sensitivity, specificity of ascitic fluid cholesterol was 96.55% and 96.67%, 90.00% and 92.00%⁷, 100.00% and 96.00%³ while diagnostic accuracy was 96.63%⁶, 85.00%³ and 97.00%⁷ respectively. Among the new parameters being investigated the ascitic fluid cholesterol has shown promise^{3,4,6}. The pathogenesis of high ascitic fluid build cholesterol level in patients with malignant disease is not clearly known. It has been suggested that fraction of the cholesterol could be derived from malignant cell membranes⁹. Another possibility is that cancer cells cause a relative blocking of the lymphatic drainage from the peritoneal space and that such blocking may lead to sequestration of cholesterol rich macromolecules in the peritoneal cavity. The detection of malignant cell in ascitic fluid has for long been the gold standard for diagnosis of malignant ascitis. However, malignant tumors may produce ascitis without shedding neoplastic cells in to the peritoneal cavity. Increased movement of plasma HDL and LDL in peritoneal cavity also has been hypothesized for elevation in ascetic fluid cholesterol in peritoneal carcinomatosis. Moreover, malignant cells may be falsely negative also.

Even though many tests are available to differentiate between malignant and non malignant ascitis, each test has limitations. Sensitivity, specificity and diagnostic accuracy of ascitic fluid cholesterol is higher to differentiate malignant from non malignant ascitis. Because of high diagnostic yield, less invasive, low cost and simplicity, ascitic fluid cholesterol is very useful to diagnose malignant ascitis.

CONCLUSION:

Ascitic fluid cholesterol having high specificity can be used to differentiate malignant and nonmalignant ascitis. It is simple and cost effective parameter, can be widely used in small centers with limited diagnostic facilities.

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