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A Cytological Study of Peritoneal Fluids and Its Clinicobiochemical Correlation.

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Abstract: *The study was a comparative evaluation of the physical and Bio-chemical components of ascitic fluid in different disease conditions associated with ascites e.g. Malignancy, Tuberculosis, Liver Cirrhosis, C.C.F., Nephrotic Syndrome, Anaemia-Hypoproteinemia & Spontaneous bacterial peritonitis. The study also highlights disease wise age and sex incidence.*

Keywords: *Ascites, cytology, peritoneal fluid, cirrhosis*

I. Introduction

Ascites means presence of excess fluid in the peritoneal cavity, normally upto 50 ml of fluid is present. Ascites is a common clinical condition that poses a diagnostic problem to the clinicians. Some of the causes of peritoneal effusions include congestive cardiac failure, cirrhosis, neoplasms and infections. Transudates are clear fluids with a low protein content and a glucose content similar to serum .Exudates are slightly hazy fluids with a high protein content and low glucose.

Jain SR et al [1] found that in cases of tuberculosis, the ascitic fluid sugar was low compared to blood sugar. Gorozhansky et al [2] stated that ascites from malignant neoplasms had high glucose content.The correct diagnosis of the fluid as transudate or exudate is important because if the fluid is exudative then further diagnostic procedures like cytopathology, biopsy and other invasive procedure can be done. On the other hand, if transudative then treatment can be given.

The differentiation of the fluid into malignant or non-malignant fluid has a deep impact on the course of the treatment to be followed. The presence of cancer cells in the fluid is a proof positive of malignancy related fluid but in 30 to 60 percent of cancer cases, cancer cells are not detected. Exfoliative cytology for malignant cells is highly specific though less sensitive (40-60%)[3].

The present study is undertaken to detect malignancy, differentiate ascitic fluids into transudates and exudates by using fluid protein parameter and also to correlate with clinical findings.

II. Materials And Methods

A prospective study was carried out at a teaching hospital in Navi Mumbai over a period of two and a half years from May 2009 till October 2011. A total number of 50 cases (ascitic fluids) were studied.

Fluid for routine analysis and cytology was done in respect of physical examination and microscopic examination by noting the appearance and colours. Total WBC count and RBC count of fluid was carried out using Neubauer's chamber. The sediment, smears were prepared and stained by field's and leishman stain for differential count and papanicolaou stain for cytology. The supernatant fluid was analysed for biochemical parameters (fluid protein and sugar).

Criteria for selection of patients:

The patients presenting with ascites were taken into account. All cases were clinically diagnosed. Patients of nephrotic syndrome, severe anemia-hypoproteinemia, spontaneous bacterial peritonitis were also included in this study.

III. Results

TABLE NO.1: ETIOLOGICAL CLASSIFICATION OF 50 CASES OF ASCITIC FLUIDS

Diagnosis	No. of cases	%
Liver cirrhosis	29	58
Nephrotic syndrome	7	14
	5	10

Anaemia-hypoproteinemia		
Tuberculosis	4	8
Malignancy	2	4
Congestive cardiac failure	2	4
Spontaneous bacterial peritonitis	1	2
Total	50	100

Liver cirrhosis (58%) was found to be the most common cause of ascitic fluids.

Table No.2 :Age and sex distribution of 50 ascitic fluid cases.

Diagnosis	**Gender**		**Age (years)**					**Total**
	Female	Male	10-20	20-30	30-40	40-50	>50	
Malignancy	2(100%)	0	0	0	0	0	2	2
Tuberculosis	3(75%)	1(25%)	0	1	3	0	0	4
Cirrhosis	0	29(100%)	1	2	6	14	6	29
Nephrotic Syndrome	3(42.9%)	4(57.1%)	0	1	2	3	1	7
Anaemia-hypoproteinemia	3(60%)	2(40%)	2	0	0	1	2	5
CCF	0	2(100%)	0	1	0	0	1	2
Spontaneous bacterial peritonitis	1(100%)	0	0	0	1	0	0	1
Total	12(24%)	38(76%)	3	5	11	18	12	50

Male predominance was found in all the diseases (76%) causing ascitis. Majority cases of liver cirrhosis (28%) were found in 5th decade.

Table no. 3: Gross appearance of fluid in 50 ascitis fluid

Diagnosis	Colour			Total
	Straw	Turbid	Yellow	
Malignancy	0	2	0	2
Tuberculosis	4	0	0	4
Liver cirrhosis	9	0	20	29
Anaemia-Hypoproteinemia	1	0	4	5
Nephrotic syndrome	1	0	6	7
CCF	1	0	1	2
Spontaneous bacterial peritonitis	0	1	0	1
Total	16	3	31	50

Table No. 4 : Distribution of Leucocyte count in 50 cases of ascitic fluid

Diagnosis	**Total WBC counts**			**Total**
	<100/cm m	100-500/cm m	>500/cm m	
Malignancy	0	1	1	2
Tuberculosis	0	1	3	4
Liver Cirrhosis	25	4	0	29
Nephrotic Syndrome	7	0	0	7
Anaemia-hypoproteinemia	5	0	0	5
CCF	2	0	0	2
Spontaneous bacterial peritonitis	0	1	0	1
Total	39	7	4	50

In case of liver cirrhosis, (86.2%) showed W.B.C <100 cells /cmm with lymphocytic predominance .The solitary case of S.B.P showed W.B.C count <500 cells /cmm with polymorph predominance

Table No. 5: Cytology of malignant fluids

Fluids	No. of cases	Histopathological	Malignant cells on cytology
Ascitic fluids	1	1. Well differentiated Adenocarcinoma of lung	detected
	2	2. Well differentiated adenocarcinoma of lung	detected

Table No. 6: Categorization of Fluids Based on Diagnosis

Diagnosis	Ascitis		
	Exudates	Transudate	Total
Malignancy	2	0	2
Tuberculosis	2	2	4
Liver Cirrhosis	3	26	29
CCF	0	2	2
Nephrotic syndrome	1	6	7
Anaemia - Hypoproteinemia	0	5	5
Spontaneous bacterial peritonitis	1	0	1
Total	9	41	50

IV. Discussion

ETIOLOGICAL INCIDENCE: In the present study,cirrhosis was the most common cause of ascites ,comprising 58% of the cases .Spontaneous bacterial peritonitis was observed in one patient with incidence rate of 2% and the incidence of ascites in tuberculosis was found to be 8% which is slightly lower than the previous study [4]. The most probable reason for the decline in tuberculosis is early detection and early treatment of patients.

The incidence of nephrotic syndrome (14%), anaemia hypoproteinemia (10%) (table 1) and CCF(4%) are slightly higher than the previous workers[4,5].

In the study the incidence of ascites due to malignancy was 4% which is slightly lower than the study by KhanT.H et al [6].

AGEWISE INCIDENCE OF ASCITES

Most of the cases were in 5^{th} decade with majority of abdominal tuberculosis observed in 3^{rd} and 4^{th} decade and nephrotic syndrome in 5^{th} decade. In the present study, two cases of CCF were found, one in 3^{rd} decade and one in 4^{th} decade.

Both the cases of malignant ascites were found in older age group i.e. beyond 5^{th} decade, which in accordance with study by Mehrotra et al[7].Anaemia-hypoproteinemia were found in 2nd decade and in 5th decade.

SEXWISE INCIDENCE OF ASCITES

In this study, 76% were patients and 24% were female .All cases of cirrhosis of liver were male whereas female predominance was seen in abdominal tuberculosis (75%), anaemia -hypoproteinemia and malignancy (100%). Male predominance was observed in case of CCF.

ASCITIC FLUID GROSS EXAMINATION

In cirrhosis, the samples of ascitic fluid were clear yellow or straw coloured and turbid ascitic fluid in spontaneous bacterial peritonitis, which is in accordance with reports from previous workers[4,6,8].

Clear yellow or straw coloured ascitic fluid was found in nephrotic syndrome, CCF and tuberculous peritonitis.

In malignant ascitis, the flusid was turbid in all the cases, though most studies have reported hemorrhagic ascitic fluid[4,5,6].

ASCITIC FLUID CYTOLOGY

In this study the total WBC count of <100 cells/cmm were seen in 86.20% of the cases of cirrhosis as compared to Jain S.C>et al (36%)[4,5] and between 100-500 cells/cmm were seen in 13.80%.

In case of spontaneous bacterial peritonitis, polymorph was predominant. In liver cirrhosis lymphocytic predominance was found in 93.1% of the cases as compared to Nath et al where it was 59% [5].

In cases of nephrotic syndrome, CCF and anaemia-hypoproteinemia total WBC count of <100/cmm with lymphocytic predominance was observed.

In tuberculous peritonitis, lymphocytic predominance was seen in all cases.

In the study the cases of malignant ascites showed >100cells/cmm with lymphocytic predominance and exfloliative cytology for malignant cells was positive. Well differentiated adenocarcinoma of lung was diagnosed in both the cases.

BIOCHEMICAL PARAMETERS

In this study, a total of 50 fluids were studied, out of 50 ascitic fluids, 43 were found to be transudates and 7 were exudates. Transudates comprised cases of liver cirrhosis, nephrotic syndrome, anemia-hyporoteinemia and CCF.

Exudates comprised cases of tuberculosis, malignancy and subacute bacterial peritonitis.

V. Conclusion

The study is conducted to evaluate the importance of the examination of Intra Peritoneal fluid in various disease conditions associated with intra peritoneal free fluid for clinicobiochemical correlation with the diagnosis of the underlying disease.

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