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Study of Peritoneal Fluid- An Experience in a Tertiary Care Rural Hospital

Wasim M. Khatib[1], Rakesh B. Demde[2], Pankti M. Patel[3], Vidya Aher[4].
[1]*Assistant Proffesor, Department of pathology, K.I.M.S, Karad, India.*
[2,3,4]*Assistant Lecturer, Department of pathology, K.I.M.S, Karad, India.*

Abstract:
Background: *Peritoneal fluid or ascitic fluid is a day to day specimen in the department of Clinical Pathology and Cytology. Ascites is a common clinical sign which is a result of excessive accumulation of fluid in peritoneal cavity. As in pleural fluid, ascitic fluid is also classified as exudate and transudate indicative of the underlying pathology.*
Material and Methods: *The present work is a descriptive, cross-sectional, analytical and retrospective type of study, undertaken in the department of Pathology of a tertiary care hospital over a period of one year from January 2015 to December 2015. The peritoneal fluid received were processed and studied for the cell count, number, cellular features, presence or absence of organisms if any and malignancies.*
Result: *176 (52.07%) cases out of a total 338 samples were received over a 1 year period. There was a slight male preponderance with 89 (50.56%) cases and females composed of 87 (49.43%) cases. Mean age of presentation among all patients was 51.6 years. A total of 18 cases (10.22%) were malignancies.*
Conclusion: *Peritoneal fluid is one of the common body fluids to be studied in every day practice. Meticulous cytologic evaluation is of paramount importance as numerous malignant and non malignant pathologies can lead to effusions.*

I. Introduction

"Askitos" is the Greek word for bladder or bag. The word Ascites which denotes pathological accumulation of fluid in the peritoneal cavity is derived from it [(1)]. Ascites is not a disease per se rather it is a sign elicited by physician. Normally, as in any other cavity in the body, peritoneal cavity is lined by its native mesothelial cell layer, is lubricated by a small amount of fluid which is considered as free fluid. Any increase in this fluid constitutes ascites.

Traditionally ascitic fluid is classified as exudative and transudative based on its protein content.[(2,3)] Diseases of the liver account for majority of the cases of ascites followed by malignancies, cardiac failure, infective causes such as tuberculosis, invasive procedures like dialysis, inflammatory conditions like pancreatitis.[(4)] With this study we aim to analyze the peritoneal fluids received in the department of Pathology and study them with respect to clinical, demographic and radiologic features.

II. Materials And Method

The present work is a descriptive, cross-sectional, analytical and retrospective type of study, undertaken in the department of Pathology of a tertiary care hospital over a period of one year from January 2015 to December 2015. The clinical, demographic and radiological findings were obtained from the cytological requisition sheets.

The samples were received within 15 minutes of tapping. All the samples were centrifuged at 2500 RPM for 5 minutes. Supernatant was discarded and sediments were taken on the slides and smeared. Two slides were air dried and stained with Leishman and two were fixed with methanol and stained with H&E stain. The slides were studied on light microscopy. Individual cases were evaluated according to following cytological features. Cell type, number, size, architecture (Acini / Sheets/ 3D balls/ Papillae/ Rosette), nuclear and cytoplasmic features, features of dysplasia, background features. All the data was then statistically analysed.

III. Observation

In our study, 338 fluids were received of which 176 (52.07%) were peritoneal fluids. Male comprised of 89 (50.58%) cases and females comprised 87 (49.43%) cases. Slight male preponderance were noted [Table 1].

Table1. Distribution of cases according to clinical features

Parameters	Non malignant (158)	Malignant (18)
Mean age (51.6)	47.2 years	56.4 years
Male (89)	89 (50.56%)	-

Female (87)	69 (39.20%)	18 (10.22%)
Gross features		
Clear (straw coloured)	106 (60.22%)	2 (1.13%)
Hemorrhagic	54 (30.36%)	10 (5.68%)
Turbid	2 (1.13%)	6(3.40%)

Most common age group affected was 6th decade. Youngest patient was a 16 years female were as the oldest was an 84 years male. Mean age of presentation across both sexes was 51.6 years [Table 1]. Out of 176 cases, non malignant cases formed majority of the cases 158 (89.77%) and malignant were 18 cases (10.22%) [Table1].

Mean age of presentation in non malignant cases was 47.2 years and that in malignant cases was 56.4 years. There was not a single case of malignancy in males whereas as majority of cases of Ascites in females were non malignant, 69 (39.20%) [Table1].

Out of 176 cases, 112 cases (63.63%) were transudates whereas 64 cases (36.36%) were exudative in nature. When studied grossly majority of the specimens were clear that is 108 (61.35%) cases followed by hemorrhagic appearance in 64 cases (36.36%). Turbid fluids were noted majorly in malignant 06 (3.4%) cases [Table 2].

Table2. Distribution of cases according to diagnosis and nature of effusion

Aetiological factors	Number of cases (176)	
	Transudate (112)	Exudate (64)
Acute infection	-	18 (10.22%)
Tuberculosis	6 (3.40%)	28 (15.90%)
Cirrhosis	84 (47.72%)	-
CCF	13 (7.38%)	-
Renal failure	7 (3.97%)	2 (1.13%)
Malignancy	2 (1.13%)	16 (9.09%)

Various aetiologies leading to exudative and transudative effusions were noted in our study. 18 (10.22%) were malignant cases, all which are seen in female patients. Among those 12 cases (66.66%) of adenocarcinoma were noted, with 08 cases of ovarian origin and 04 of gastrointestinal origin. 04 cases (22.22%) of metastatic squamous cell carcinoma and 02 cases (11.11%) of hematological origin were noted.

Amongst non malignant aetiologies, cirrhosis was the most commonly encountered cause with 84 cases (47.72%) followed by 34 cases (19.31%) of tuberculosis. All the cases of cirrhosis were transudative and tuberculosis seen in 28 cases (15.90%) predominantly was exudative. Amongst other aetiologies of exudative nature, acute infection related ascites comprised of 18 (10.22%) cases followed by malignancies with 16 (9.09%) cases.

IV. Discussion

As simple as it sounds, ascetic fluid cytology goes a long with in diagnosis of different pathologies and stage assessment in certain malignancies[5]. Literature mentions various etiologies to be responsible for peritoneal effusions, be it transudates or exudates. Decompensated phase of hepatic failure, cardiac failure, Nephrotic syndrome, acute infective stage and not to forget malignancies, are few of the most important causes of peritoneal effusions[6].

In our study, age group affected was 16-84 years with the most commonly affected being in 6th decade. This study is in agreement with Udasimath et al study[7]. Studies by Hwangbo et al, Khan et al and Mahmood et al[8, 9, 10] in their studies reported liver cirrhosis to be the most common etiology amongst non-malignant causes of ascites. As seen in their studies, liver was the most common setting for ascites as in our study. Amongst infective causes tuberculosis was the foremost cause of exudative ascites. Amongst other exudative causes of ascites spontaneous bacterial peritonitis was also noted in our study.

Exudative ascites is a result of damage to the capillaries and leakage of fluid from within[11]. Intra-abdominal abscess, tuberculosis, bacterial peritonitis, trauma, pancreatitis, primary and secondary malignancies give rise to exudative effusion whereas cirrhosis, congestive cardiac failure, constrictive pericarditis, portal and hepatic vein obstruction, malnutrition and nephritic syndrome are causes for transudative ascites.

As widely accepted peritoneal tapping is performed to assess the tumor stage most of the times. In almost 75% of cases of malignancy ascites the tumor cells are seen only when they lie in peritoneum[12, 13]. So it is to be understood that patients having massive liver metastasis or hepatic cell carcinoma should not be expected to have malignant ascites[12, 13, 14].

One of the most common primary malignancies to give rise to malignant ascites is from the ovary[15]. Capsular invasion can be fairly assessed in ovarian malignancies by cytological evaluation of ascetic fluid or

peritoneal washings[16, 17]. Presence of malignant cells in peritoneal fluid does not necessarily change the stage of the disease however it is definitely a poor prognostic sign which requires more intense treatment[18].

Other than ovarian malignancies, gastro-intestinal malignancies also more commonly give rise to malignant ascites. In children, haematological malignancies such as lymphomas are a cause of malignant ascites[19]. Hence an accurate and meticulous cytological evaluation of fluid obtained from such patients is very important to reduce morbidity and mortality. Our study was in concordance with studies such as Khan et.al[15]. Majority of the cases were adenocarcinoma originating primarily from ovary and gastro-intestinal tract.

V. Conclusion

Peritoneal fluid evaluation is a simple, relatively patient compliant, cost effective and economical investigation. Presence of malignant cells in peritoneal fluid surely is the poor prognostic sign. Distinction between the nature of the effusion is a fair guide to ascertain the underlying pathology. Reactive mesothelial cells are closed mimick of malignancy which requires meticulous evaluation as well as expertes. Owing to vast range of pathology that can give rise to Ascites we need to have a pragmatic approach while dealing with each case.

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