

Cytological Analysis of Pleural Fluid and Ascitic Fluid – A Study from Rural Tertiary Care Hospital, Chamba (H.P)

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Abstract: Introduction - Fluid cytology is a simple and initial investigation for the diagnostic evaluation of body fluids, helping the clinician in establishing the differential diagnosis. Cytological analysis of fluids is performed as a diagnostic test to examine the centrifuged sediment and to search for the cause of abnormal fluid collection.

Material and methods- The present study was carried out in the Department of Pathology in Pt. Jawahar Lal Nehru Govt. Medical College, Chamba (H.P), from November 2017 to June 2018 on pleural fluid and ascitic fluids samples.

Results- Pleural fluid cases form 80 % and ascitic fluid cases form 20 % of the total. 90% cases in pleural fluid were non- neoplastic and remaining 10 % were neoplastic. In ascitic fluid, 80 % cases were non-neoplastic and 20 % cases were neoplastic.

Discussion- In our study, we assessed the distribution of pleural fluid and ascitic fluid. We found that most common non – neoplastic lesion was chronic inflammatory type in both pleural and ascitic fluid.

Conclusion- The present study demonstrates that the fluid cytology is the most useful test in establishing the diagnosis of pleural effusion and ascites. Cytologic study of fluid is a complete diagnostic investigation which helps at pointing out the cause as well as, in certain cases, is useful in follow up of disease process.

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I. Introduction

Fluid cytology is a simple and initial investigation for the diagnostic evaluation of body fluids, helping the clinician in establishing the differential diagnosis. It is one of the oldest laboratory method of cytology. [1]. Cytological examination of fluids is very important as it provides information about type of ongoing pathology - infection, whether acute or chronic, type- bacterial, viral and parasitic, or reactive process and to rule out presence or absence of tumor (benign or malignant). Due to any of the pathological process, there is an excessive and abnormal accumulation of fluid in serous cavities. Therefore Cytological analysis of fluids is performed as a diagnostic test to examine the centrifuged sediment and to search for the cause of abnormal fluid collection.[2].

Cytological study of fluids is a useful diagnostic investigation. The information from the examination helps at pointing out the cause of effusion and its differential diagnosis. Also, it aids in management of patient therapy and in follow up of the same. In diagnosis of cytological smears, the main diagnostic challenge remains accurate identification of cells as malignant or reactive mesothelial cells. For giving a confident diagnosis of malignant pathology on cytological smear, a thorough screening, careful examination of cellular features and an clear understanding of range of reactive changes is essential. Also, cytologic features of various metastatic malignant cells in smears point towards primary site and thus help in diagnosis of metastatic pathology.

The present study was undertaken in our setup to examine the cytomorphology of pleural and ascitic fluid using conventional smears, and to give cytological diagnosis of fluid examination thus evaluating the diagnostic accuracy of cytological analysis of fluids.

II. Material And Methods

The present study was carried out in the Department of Pathology in Pt. Jawahar Lal Nehru Govt. Medical College, Chamba (H.P), from November 2017 to June 2018 on pleural fluid and ascitic fluids samples. We received the samples from various departments like medicine, radiotherapy, surgery etc. Proper clinical history of the patient was noted on cytology forms. Physical attributes of the fluid like volume, color, appearance were also noted for every sample fluid. The samples were centrifuged at 300rpm for 3 minutes,

smears were made from centrifuged sediment, stained with Giemsa stain, air dried and labeled. Final diagnosis was given after thorough microscopic examination of smears at low power, high power and oil immersion fields.

Study Design: retrospective study of cytology fluids

Study Location: This was a rural tertiary care teaching hospital based study done in Department of Pathology, at Pt. Jawahar Lal Nehru Govt. Medical College, Chamba (H.P).

Study Duration: November 2017 to June 2018.

Sample size: 50 patients.

Subjects & selection method: The study population was drawn from patients coming to cytology section with pleural fluid and ascitic fluid. We obtained proper clinical history from the patients. Physical characteristics of the fluid were noted- color, volume, appearance. For the study, we divided the fluids into two categories- pleural and ascitic. Also gender distribution was done. Neoplastic cases and non- neoplastic cases were separately noted down.

Inclusion criteria

- 1.All ages
- 2.Either sex

Exclusion criteria

- 1.Patient not giving consent
- 2.Patients not giving history

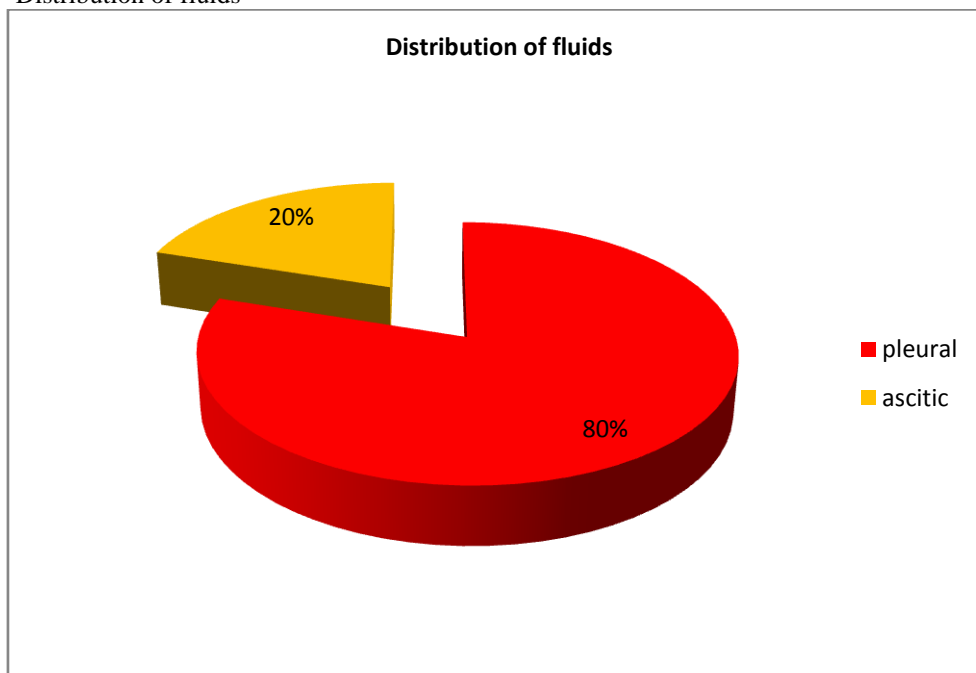
Statistical analysis

Data was analyzed using Ms Excel and SPSS version 20 .

III. Result

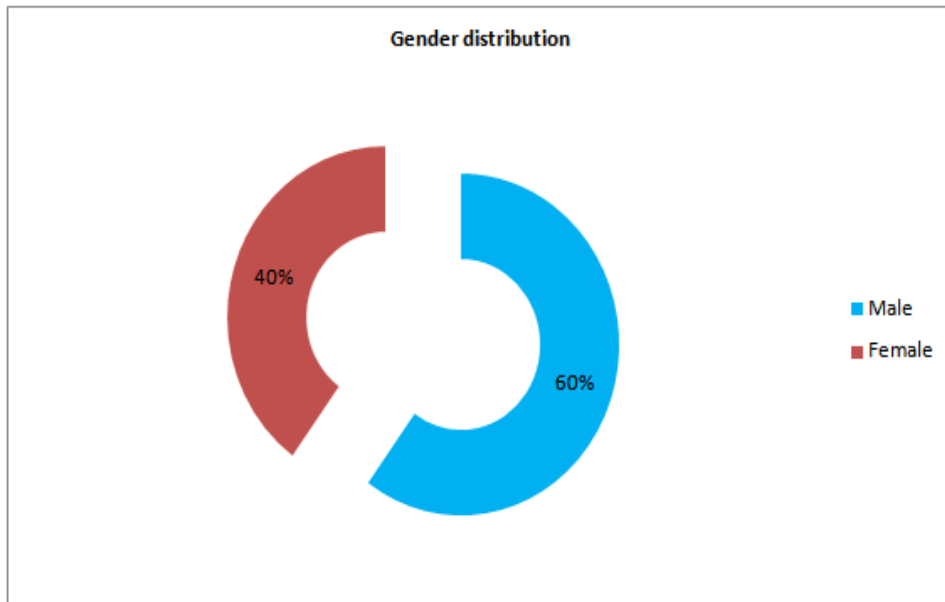
We had 50 cases during our study period. We included pleural fluid and ascitic fluid in our study.

Graph 1- Distribution of fluids



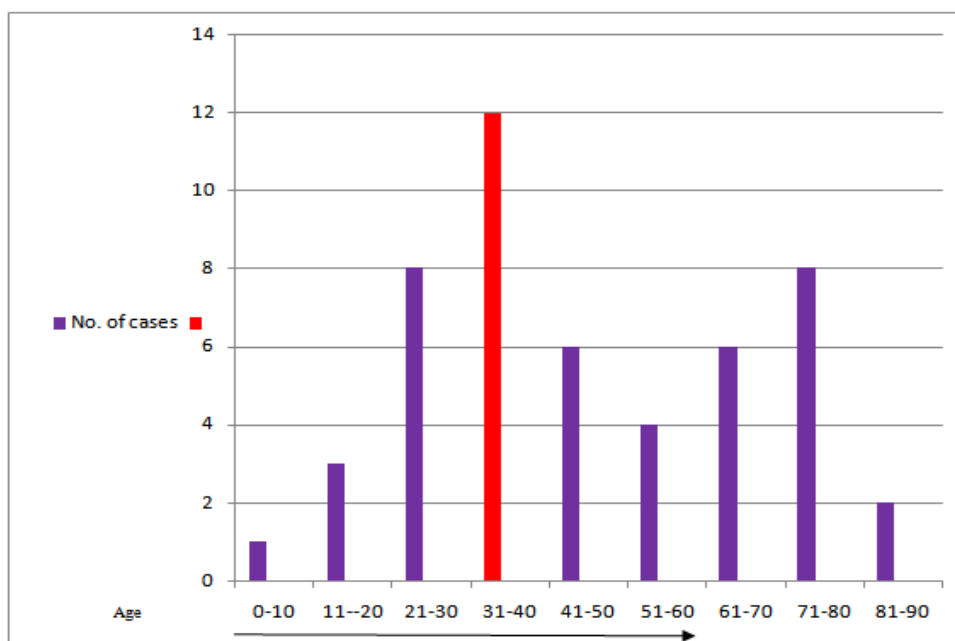
Graph 1 shows distribution of fluids. Pleural fluid cases form 80 % (40 cases) and ascitic fluid cases form 20 % (10 cases).

Graph 2-Gender distribution



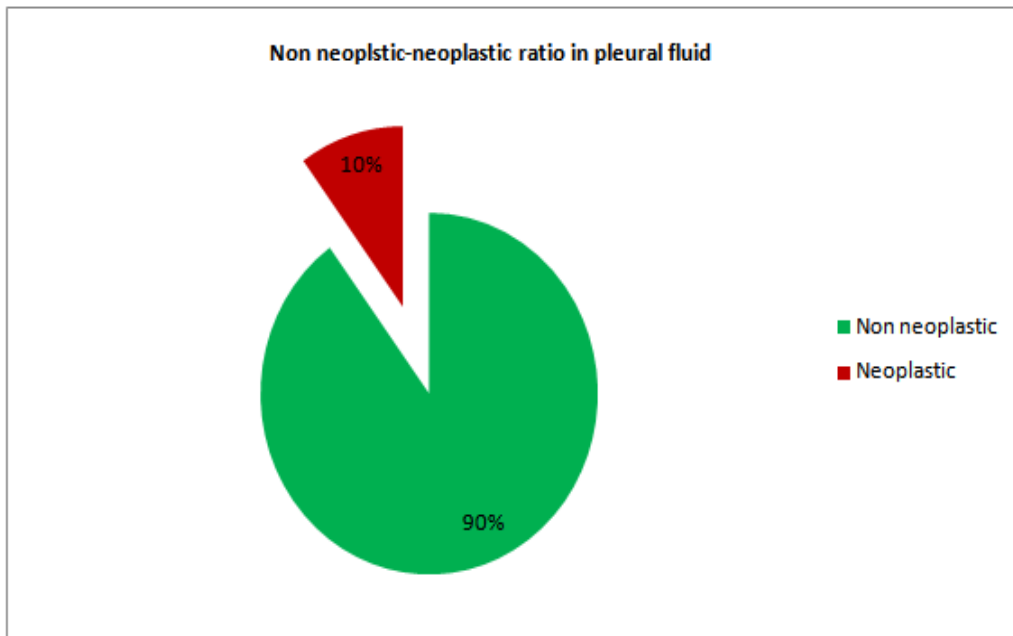
Graph 2 shows distribution of cases on the basis of gender. No. of male patients is higher (30 cases), forming 60 % and female patients is lower (20 cases) accounting to 40%.

Graph 3 - Age distribution in fluids



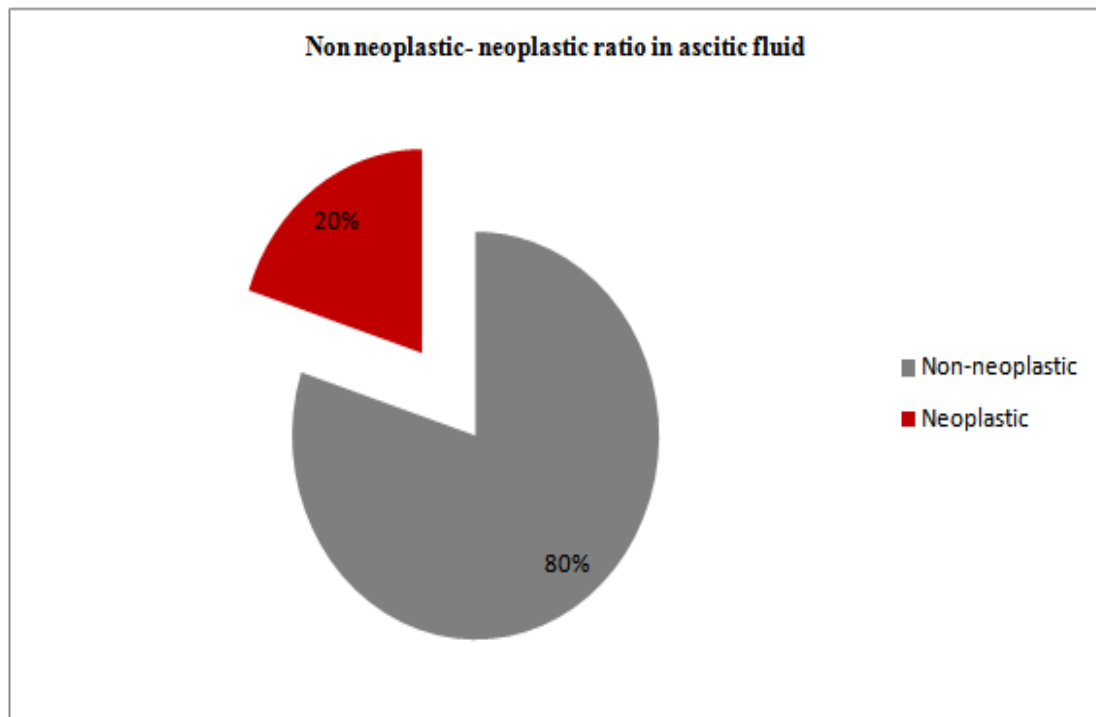
Graph 3 shows distribution of fluids on the basis of age of patients. Age group 31-40 shows the maximum no. of cases (12), followed by age groups 21-30 and 71-80 with 8 cases, then age groups 41-50 and 61-70 with 6 cases each, followed by 4 cases in 51-60 age group , and 11-20 age group showing 3 cases, 2 cases in 81-90 age group, and 1 case in 0-10 age group.

Graph 4- Non neoplastic – neoplastic ratio in pleural fluid



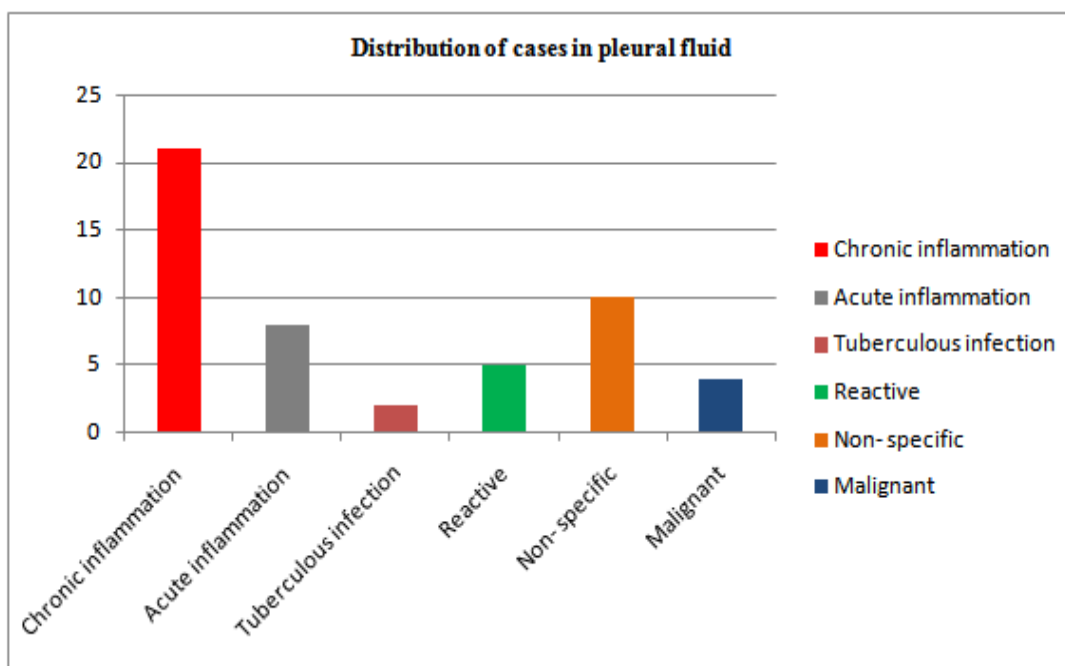
Graph 4 shows pleural fluid distribution on the basis of neoplastic-non-neoplastic case ratio. Non- neoplastic lesions form 90 % (36 cases) and neoplastic lesions form 10% (4 cases).

Graph 5 –Non- neoplastic – neoplastic ratio in ascitic fluid



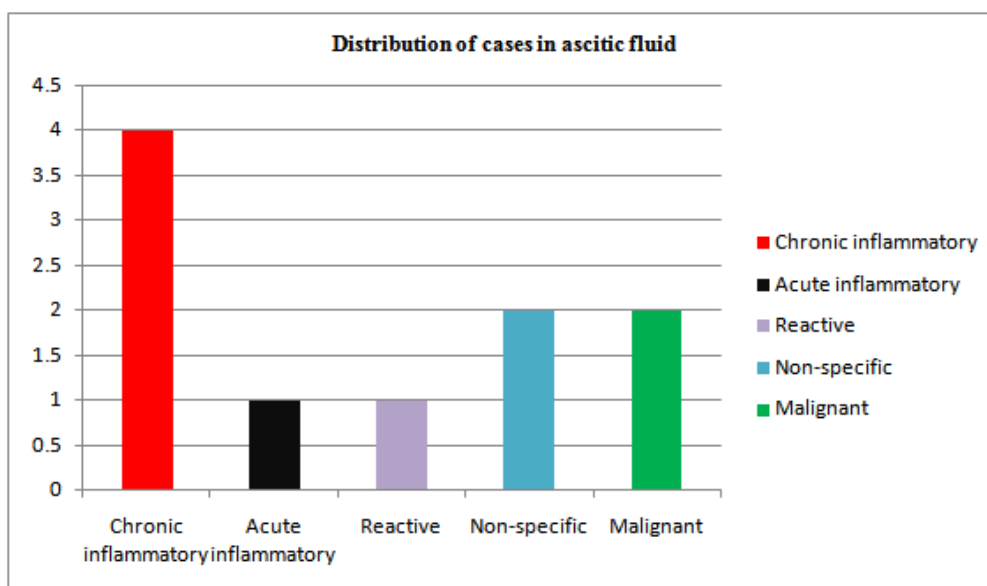
Graph 5 shows distribution of ascitic fluid on the basis of neoplastic- non-neoplastic lesions. As can be seen, neoplastic cases form about 20% (2 cases) and non-neoplastic cases form about 80 % (8 cases) of the total.

Graph 6 –Pleural fluid distribution



Graph 6 shows pleural fluid distribution according to the type. Chronic inflammatory cases form the majority (21), followed by non-specific type (10), followed by acute inflammatory cases (8), then reactive cases (5), 4 cases of malignant type and then 2 tuberculous cases.

Graph 7- Ascitic fluid distribution



In graph 7, chronic inflammatory type had maximum no. of cases (4), followed by malignant and non-specific type (2 cases each). There was 1 case each of acute inflammatory and reactive type.

IV. Discussion

We had a total of 50 cases in our study period. Males constituted 60 % of the total and female cases were lower, forming 40 %. Gojiya P⁶ also reported higher no. of male cases (72%) and lower female patients (28 %). Similar study was done by Arifulla K et al³, showing higher no. of male patients (70 %) and lower no. of females (30%).

Out of all cases, pleural fluid cases were higher forming 80 % of the total. No. of ascitic fluid samples were much lower than pleural fluid, making up 20 % of the total. Kumavat et al⁴ and Prasad Rajan⁵ also had similar findings, showing higher pleural fluid cases.

It can be observed from our study, that 31-40 yr age group had highest no. of cases, followed by 21-30 and 71-80 yr age group. Study by Gojiya P⁶ showed that 59-68 yr age group had maximum no. of cases , closely followed by 19-28 yr age group, not completely matching with our study.

In pleural fluid samples, non- neoplastic cases formed the majority (90%), whereas neoplastic cases made up 10 % of the total. In ascitic fluid cases also, non- neoplastic type was much higher (80 %) than neoplastic type (20 %). Our study matches with study of Gojiya P⁶ who also showed higher non- neoplastic cases (95 %) than neoplastic cases.

In our study, we assessed the distribution of pleural fluid and ascitic fluid. We found that most common non – neoplastic lesion was chronic inflammatory type in both pleural and ascitic fluid. Prasad Rajan⁵ also showed chronic inflammatory lesion most common in their study, similar to our study.

We had 10 % malignant lesion in pleural fluid and 20 % in ascitic fluid. Our study matches with study by Prasad Rajan⁵ showing similar percentages of malignant cases in pleural and ascitic fluids.

We had a low percentage of TB cases in pleural fluid cytology (5 %). Similar study was reported by Prasad Rajan⁵ also showing low no. of tuberculous pleural effusion.

V. Conclusion

The present study demonstrates that the fluid cytology is the most useful test in establishing the diagnosis of pleural effusion & ascites. Cytological study of fluid is a complete diagnostic investigation which helps at pointing out the cause as well as, in certain cases, in follow up of disease process. The cytological diagnosis depends to a great extent on the cellularity present in the sediment representative of a much larger surface area than that obtained by needle biopsy. Thus patients with an undiagnosed pleural effusion or ascites should primarily be subjected to fluid analysis for initial diagnosis and further management.

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