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Pathology

Cytomorphological Examination of Ascitic Fluid-A Prospective Study in a Tertiary Care Hospital

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Abstract **Original Research Article**

Background: The analysis of body fluids is an important diagnostic modality in routine practice. Proper evaluation of body fluids for their cytomorphological properties helps in providing an insight into the diagnostic, prognostic and therapeutic aspect of various pathological processes in the body. ***Material and methods***: The present prospective study comprised of a total of 50 cases of aspirated ascitic fluids referred to cytology section. The smears were stained by Hematoxylin and Eosin, Giemsa and Papanicolau (PAP) stains. All cases were analysed for cytological features. ***Results*:** Out of 50 ascitic fluids, the range of age varied between 5 years to 80 years. Male to female ratio was 1:1.4. Cytological findings showed that 41 (82%) cases were benign, 5(10%) cases were malignant and 4(8%) cases were suspicious of malignancy. ***Conclusion*:** Cytological evaluation of fluids is a relatively simple, rapid, inexpensive and less invasive technique and is used as a routine diagnostic investigation to arrive at a definitive diagnosis. Effusion cytology in resource limited settings still remains an effective technique.

Keywords: Body Fluids, Ascitic fluid, Benign, Malignant.

INTRODUCTION

Serous inflammation is marked by the outpouring of a thin fluid that may be derived from the plasma or from the mesothelial cells lining the peritoneal, pleural or pericardial cavities. Accumulation of fluid other than blood in these cavities is called an effusion [1]. Cytological examination of serous fluid is one of the commonly performed investigations. It helps in diagnostic, therapeutic and prognostic implications [2]. Primarily it assists the clinician in formulating and pointing out the etiology of effusion and list of differential diagnosis. It also allows one to follow the results of therapy and prognosis.

It is a relatively simple and noninvasive technique, which helps in coming to a conclusion about etiology of effusion as inflammatory, benign or malignant. Most importantly it gives a significant contribution in cancer research and staging of various tumors. Most commonly analysed fluids are pleural, ascitic, pericardial and occasionally peritoneal fluid/wash. Cytologic evaluation is the best way to detect the presence of malignancy in body cavity fluids [1]. Cytological assessment of effusion fluid is better than the biopsy of the serous cavity lining for the diagnosis of malignancy affecting any of the cavities, as focal lesions on a serous surface may be missed by biopsy giving false negative results. But in an effusion, exfoliated malignant cells accumulate from all surfaces lining representating the entire serous cavity and are simple to collect [3]. The general cytologic examination can be performed easily, quickly, and inexpensively by conventional smears.

MATERIALS AND METHODS

The present study was conducted in the cytology section of Department of Pathology, Sri Venkateshwaraa Medical College Hospital & Research Centre Puducherry, from a peroid of one year after obtaining due clearance from Institutional Ethics Committee. The study was performed to analyze ascitic fluids for various pathological conditions. A total of 50 cases of aspirated ascitic fluids were studied. The fluid samples received were centrifuged at 2000 revolutions per minute for 10 minutes. The supernatant was discarded. Minimum of three smears were prepared. Both air dried and wet fixed smears were made from the sediment and stained by Giemsa, Haematoxylin and Papanicolau (PAP) stains respectively, using standard Methods.

RESULTS

Fifty cases of ascitic fluid specimens were examined. The range of age varied between 5 years to 80 years of age as shown in Table 1. The maximum number of samples was in the age group 51- 60 years. In females, maximum number of samples was in the age group of 51-60 years. In males, the maximum number of samples was in the age group of 61-70 years. Least number of samples were in the age group of <10, 11-20 and 71-80 years. Female preponderance was noted. Out of 50 cases, 29 were females and 21 were males with female to male ratio being 1.4:1. Above observations are shown in Table 1.

Cytological findings showed that 66 % cases showed mild cellularity, 24% were moderately cellar smear and 10% cases were showing marked cellularity (Table 2). Benign effusion were the predominant diagnosis given in fluid analysis (82%) and 8 % reported as suspicious for malignancy. Malignancy was reported only in 10 % of cases (Table 4). The most common pathology reported in benign effusion was chronic liver disease and in malignant effusion was carcinoma ovary (Table 3).

DISCUSSION

Cytological examination of serous effusions is of paramount importance in diagnostic, therapeutic and prognostic implications. The cytologic study of fluids represents the cell population from a much larger surface area than that obtained by needle biopsy [4, 5]. Cytology has a greater opportunity than needle biopsy to retrieve malignant cells in the presence of malignant deposits [5, 6]. It has gained increased acceptance in clinical practice today, since it is relatively simple, safe and an inexpensive procedure [7].

In our study, a total of 50 cases of aspirated ascitic fluid specimens were studied. Age of patients in our study ranged from 5 to 80 years, maximum samples were in the age group of 41-50 years. In our study females comprised of 29cases and males 21 cases. Females were more as compared to males with female to male ratio being 1.4:1.Our study was similar to Khan *et al*. [5] studied cytodiagnosis of malignant effusions and found females outnumbering males (58% vs 42%).

Cytomorphological examination of body fluids is a well-accepted method to categorize them as benign or malignant. Recognition of malignant cells is the most important goal of fluid cytology and this is often used as a first line of investigation to detect and type metastatic disease based on subtle morphological features [8-10].

However, the interpretation of malignancy is difficult in body fluids due to less number of malignant cells present in the fluid which may go unrecognized on cytological examination that leading to false-negative diagnosis. And also, reactive mesothelial cells may mimic malignant cells in conventional cytological smears, because reactive mesothelial cells show nuclear enlargement, hyperchromasia, with or without presence of prominent nucleoli and they may be arranged in rosettes, pseudoacini or acini, resulting in a false- positive diagnosis[11,12].

In the present study, a total of 5(10%) cases were malignant and 41(82%) were benign and 4(8%) cases were suspicious of malignancy. These findings were in accordance with studies done by Hathila R *et al.* and Khatib WM *et al*. [11, 13]. In our study for ascitic fluid analysis, in malignant effusions carcinoma of ovary was the commonest primary followed by primary in GIT. In Khan *et al.* [14] study, reported similar pattern of primary lesions. Adenocarcinoma was the most frequent cause of malignant peritoneal effusions. These findings are in agreement with the study of Kol PC *et al*. [15] and Monte SA *et al.* [16].

In cases of suspicious for malignancy samples, a repeat examination or cell block method should be advised. The rate of detection of malignancy is increased further if multiple effusion samples are evaluated. Fluid analysis although not a substitute for conventional histopathology but can be complementary to it in diagnosing malignant conditions.

CONCLUSION

The study of fluid cytology is used as a routine diagnostic investigation to arrive at a definitive diagnosis. Preliminary body fluid analysis using conventional smear method is still remains the simplest, convenient and cost effective technique in resource limited setups that aims to reach a particular diagnosis.

Table-1: Age and sex distribution

Sl NO:	Age in years	No of males	No of females	Total	Percentage
1	>10	1	0	1	2
2	11-20	0	1	1	2
3	21-30	2	2	4	8
4	31-40	4	5	9	18
5	41-50	4	6	10	20
6	51-60	3	10	13	26
7	61-70	7	4	11	22
8	71-80	0	1	1	2
9	Total	21	29	50	100

Table-2: Assesment of cellularity in smear

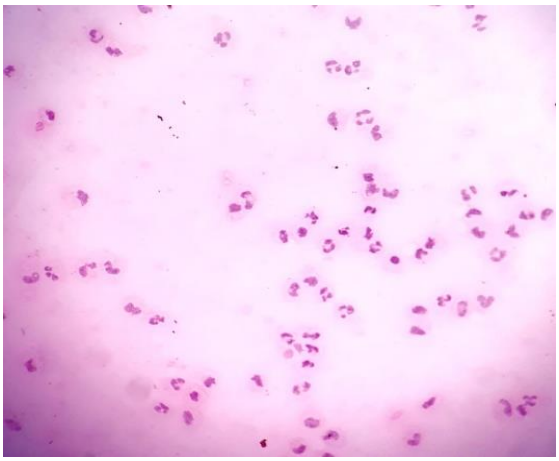
Sl NO	Cellularity	No of cases	Percentage
1	Mild	33	66
2	Moderate	12	24
3	Marked	5	10
4	Total	50	100

Table-3: Clinical Diagnosis of ascitic fluids

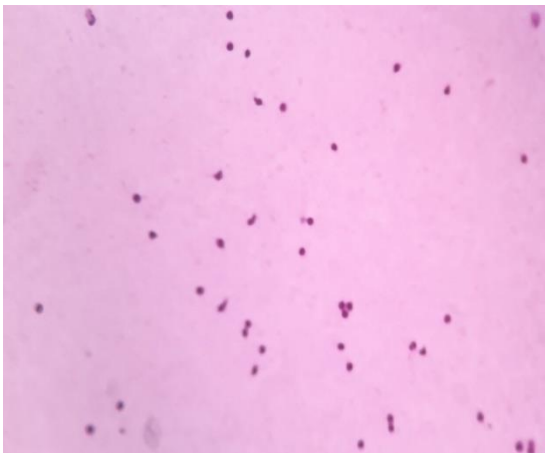
SL. NO	Clinical diagnosis	No of cases	Percentage
1	Ovarian neoplasm	18	36
2	Chronic liver disease	12	24
3	Chronic kidney disease	6	12
4	Acute appendicitis	7	14
5	Gastric carcinoma	6	12
6	Nephrotic syndrome	1	2

Table-4: Diagnosis by Smear method

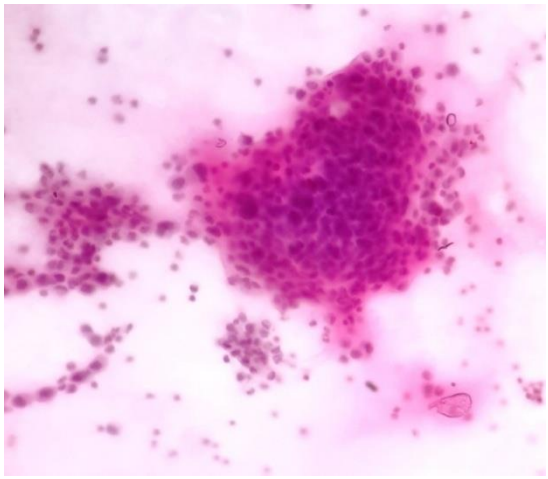
SL NO	Diagnosis	Frequency	Percentage
1	Benign	41	82
2	Suspicious	04	8
3	Malignant	05	10



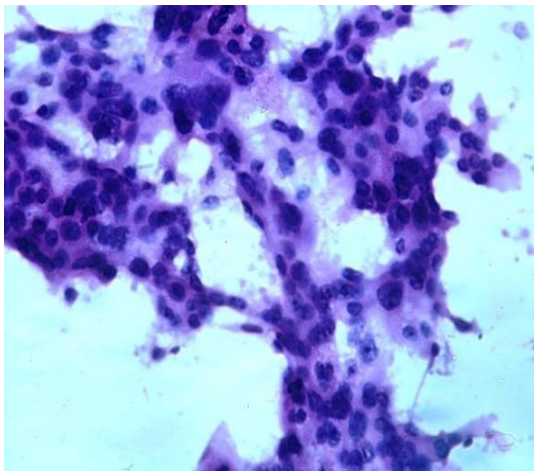
Conventional smear showing neutrophils in 40x (H&E)



Conventional smear showing lymphocytes in 40x (H&E)



Smear showing atypical cells in 40x (H&E)



Smear showing malignant cells in 40x (H&E)

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