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Research Article

Exfoliative cytology of body fluids: a study from provincial hospital of Jammu region, India

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ABSTRACT

Background: Cytological study of body fluids is an inexpensive and simple procedure useful in making diagnosis regarding etiology, understanding course of disease and to monitor the response to therapy. It has helped in staging and prognosis of the malignant tumours. The present study aims to understand cytology of various aspirated body fluids, categorize effusions into non neoplastic and neoplastic type with further classification of aspirated fluid as exudate and transudate.
Methods: A total of 185 cases of aspirated fluids coming to Pathology Department of Government Hospital Gandhi Nagar for analysis were studied over a period of one year i.e. from Jan 2015 to Dec 2015.The fluid received was centrifuged and the remaining sediment was transferred with the help of pipette onto two glass slides and spread evenly. One was stained with Giemsa and other was stained with Papanicolaou stain. Leishman stain was done in suspicious cases of CSF. Improved Neubauer counting chamber was used for the cell counts.
Results: Peritoneal fluid was most common aspirated fluid (49.7%) with overall male to female ratio was 1:1.6. Maximum cases belonged to age group of 30-40 years. Only (5.4%) 10 cases were neoplastic. Among malignant effusions maximum (60%) were adenocarcinoma, followed by squamous cell carcinoma (20%).
Conclusions: Exfoliative fluid cytology is rapid and effective method for diagnosis, evaluation and it further guides us in clinical decision making regarding management of underlying pathology.

Keywords: Adenocarcinoma, Body fluids, Effusion, Exfoliative cytology, Exudate

INTRODUCTION

In 1867, Lucke and Kiebs observed lymphocytes and other larger round cells with large clear nuclei in a milky ascitic fluid said to be rich in cells. While this may be one of the earliest references to cancer cells in a body fluid, it is difficult to verify the cancerous nature of the cells on the basis of this brief description. The first authenticated description of cancer cells in pleural and peritoneal fluids appeared in 1882. In that year Quincke published a detailed description of cancer cells originating in ovarian and pulmonary cancer.[1]

Cytological study of body fluids is an inexpensive and simple procedure useful in making diagnosis regarding etiology, understanding course of disease and to monitor the response to therapy. It has helped in staging and prognosis of the malignant tumors and also gave information regarding various inflammatory lesions of serous membranes. The main serosal body cavity fluids comprise of peritoneal, pleural, cerebrospinal and pericardial fluids.[2] It has gained increased acceptance to such an extent that a positive diagnosis was often considered as a definitive diagnosis.[3] The present study aims to understand cytology of various body fluids, categorize effusions into non neoplastic and neoplastic

type with further classification of aspirated fluid as exudate and transudate.

METHODS

The present study was an observational descriptive cross sectional study in which a total of 185 cases of aspirated fluids coming to Pathology Department of Government Hospital Gandhi Nagar for analysis were studied over a period of one year i.e. from Jan 2015 to Dec 2015. Relevant clinical information regarding age, sex and accompanying clinical symptoms had been documented.

The fluid received was centrifuged at 3000 revolutions per minute for five minutes. The supernatant was discarded. The remaining sediment was transferred with the help of pipette onto two glass slides and spread evenly. One was air dried and stained with Giemsa stain. The other slide was immediately fixed in 95% alcohol and stained with Papanicolaou stain. Leishman stain was done in suspicious cases of CSF. Improved Neubauer counting chamber was used for the cell counts.

RESULTS

A total of 185 cases were studied. Out of aspirated fluids, 92 were peritoneal, 73 were pleural, 12 were synovial and 7 were cerebro-spinal fluid (CSF) and 1 was pericardial (Figure 1). Maximum cases belonged to age group of 30-40 years followed by 40-50 years (Table 1). Overall male to female ratio was 1:1.6 (Table 2). Only (5.4%) 10 cases were neoplastic (Table 3). Among non-neoplastic cases, 80% (140 out of 175) were exudative in nature and only 20% (35 out of 175) were transudates (Table 4). Among malignant effusions maximum (60%) were adenocarcinoma, followed by squamous cell carcinoma (20%). However, small cell carcinoma and mesothelioma were equal in frequency (Figure 2).

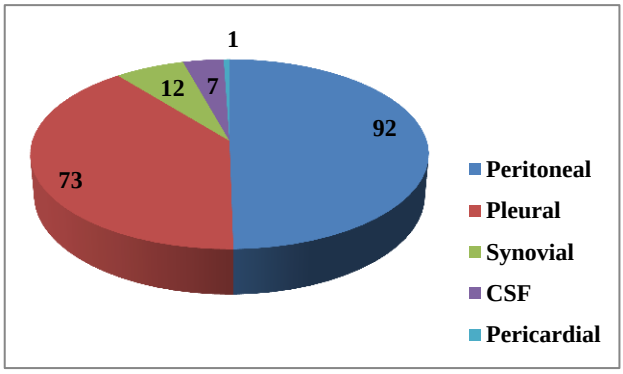

Figure 1: Distribution of number of cases according to type of fluid.

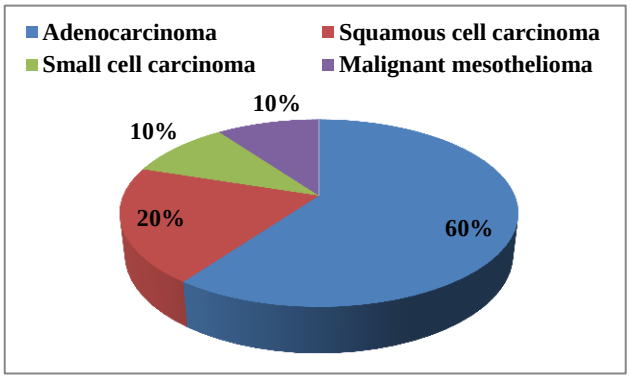

Figure 2: Distribution of Types of malignancies in neoplastic effusions.

Table 1: Distribution of cases according to age.

Age groups (in years)	Peritoneal	Pleural	Synovial	CSF	Pericardial	Total
0-10	-	2	-	5	-	7
10-20	2	5	1	2	-	10
20-30	10	28	3	-	-	41
30-40	36	19	5	-	1	61
40-50	31	12	2	-	-	45
50-60	8	4	1	-	-	13
60-70	3	2	-	-	-	5
70-80	2	1	-	-	-	3
Total	92	73	12	7	1	185

Table 2: Gender wise distribution of cases.

	Peritoneal	Pleural	Synovial	CSF	Pericardial	Total
Male	58	46	7	2	1	114
Female	34	27	5	5	0	71
Total	92	73	12	7	1	185

Table 3: Distribution of non-neoplastic and neoplastic effusions.

	Peritoneal	Pleural	Synovial	CSF	Pericardial	Total
Non neoplastic	87	69	12	7	0	175
Neoplastic	5	4	0	0	1	10
	92	73	12	7	1	185

Table 4: Distribution of non-neoplastic effusion according to biochemical properties.

	Peritoneal	Pleural	Synovial	CSF	Total
Exudate	71	61	3	5	140
Transudate	16	08	9	2	35
	87	69	12	7	175

DISCUSSION

In our study a total of 185 cases were studied. Out of aspirated fluids maximum were peritoneal followed by pleural. Males were more as compared to females. Maximum cases belonged to age group of 30-40 years followed by 40-50 years. Similar findings were observed by various studies.[4-6]

In our study peritoneal fluid was the commonest 92/185 (49.7%). Out of 185 cases, 175 were non neoplastic and 10 were neoplastic. We observed that majority of fluids were non suppurative and suppurative fluids were comparatively less in number. Similar pattern of findings were observed by authors.[4,7] The non-neoplastic exudates showed lymphocytic predominance. Most of the synovial fluids were transudate in nature with majority of them showing neutrophilic predominance. Majority of CSF fluid showed lymphocytic predominance. Most of the neoplastic effusion showed significant population of eosinophils (Figure 4). Almost 4% of the non-neoplastic effusions demonstrated reactive changes in mesothelial cells (Figure 3) which corroborated with findings of other studies.[8-10]

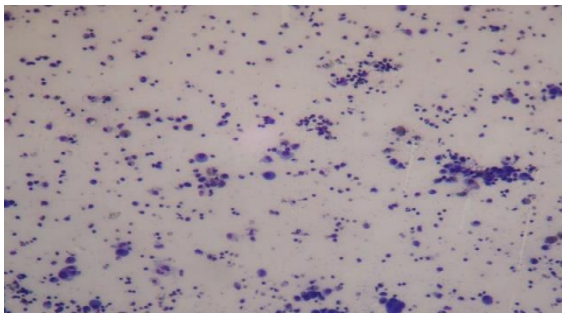

Figure 3: Microphotograph of a tubercular pleural effusion showing lymphocytosis and reactive mesothelial cells (40x, Giemsa).

In our study 10 cases showed malignant effusions, with most of them showing haemorrhagic effusion.[11] Microscopically the smears were cellular comprising of pleomorphic tumour cells arranged mostly in clusters and depicting high N:C ratio, coarse chromatin and prominent nucleoli in some cases. Malignancy in peritoneal fluid was seen in 05 cases and pleural fluid showed malignant cells in 04 cases and one case of malignant pericardial effusion was seen showing metastatic deposits of breast carcinoma (Figure 6).

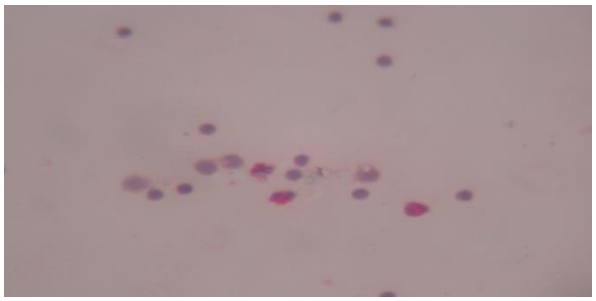

Figure 4: Microphotograph showing presence of eosinophils along with lymphocytes in a neoplastic effusion (80x, PAP).

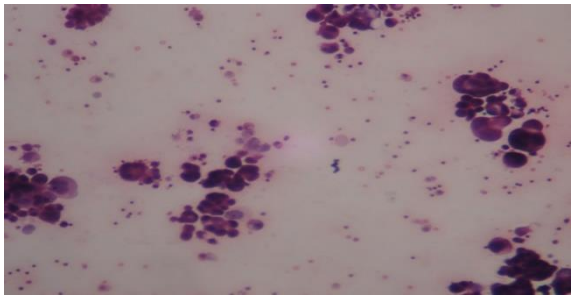

Figure 5: Microphotograph showing metastatic deposits of a signet ring adenocarcinoma in Peritoneal effusion (40x,PAP).

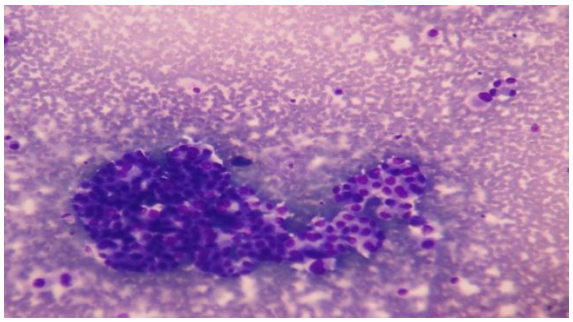

Figure 6: Microphotograph showing metastatic cluster of carcinoma breast in pericardial effusion (40x, Giemsa).

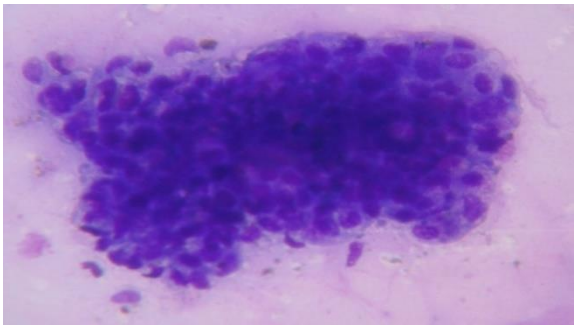

Figure 7: Microphotograph showing cluster of mesothelial cells in a pleural effusion of Malignant Mesothelioma (80x, Giemsa).

This is in contrast to findings of studies which found that pleural fluid showed highest proportion of positivity for malignant cells.[4,12] We observed adenocarcinoma as the commonest malignancy which is in concordance with other studies.[5,14-16]

CONCLUSIONS

Exfoliative cytology has helped in evaluation of aspirated fluids and reaching at a particular diagnosis which has aided in further management.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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