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Cytological Evaluation of Pathological Body Fluids: A One Year Retrospective Study in a Tertiary Care Institute

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Abstract: Introduction: *Cytological evaluation of body fluids is a rapid, simple, cost-effective and relatively patient compliant investigation. Serving both as a diagnostic as well as therapeutic intervention.* ***Material and Method****: This was aretrospective study done over aperiod of one year from January 2018 to december2018 in the department of pathology, LN Medical college and research centre, Bhopal. This study included 150 cases of Pleural, Peritoneal, Pericardial, CSF, and Synovial fluids.* ***Result****: Out of the 150 cases examined, the most common specimen was pleural fluid with 75 cases[50%] followed by Ascitic fluid with 35 cases [23.5%].The most common pathology noted in all the fluids was Infective/Inflammatory followed by malignancy. Male to Female ratio was 1:1.7.****Conclusion:****Body fluid cytology is a rapid, simple and cost effective diagnostic modality employed primarily for diagnosis in malignant and non-malignant cases which provides an assess to both clinician and pathologist to reach to a final diagnosis for further patient management*

Keywords- Body fluids, cytology, malignancy, effusion

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I. Introduction

Cytological evaluation of body fluids is a rapid,simple,cost-effective and relatively patient compliant investigation.Serving both as a diagnostic as well as therapeutic intervention ,tapping of these body fluids helps in better understanding of the disease process [1]. Most commonly analysed fluids are pleural, ascitic, pericardial and occasionally peritoneal fluid/wash.The other fluids which are analysed are synovial, pericardial. Less frequently analysed fluids are urine, sputum nipple discharges and endometrial aspirates s[4].Various disease processes which include infectious, inflammatory and neoplastic entities give rise to effusion.The overall cytological evaluation with clinical, radiological, and physical examination is an aid to primary provisional diagnosis.Our study aims to analyse various body fluids received in our institute and correlate individual case clinically .

II. Material And Methods

This study was conducted in the Department of Pathology, L.N Medical College and JK Hospital, Bhopal.
Study Design: Retrospective Observational Study
Study Location: Department of Pathology, LN Medical college and JK Hospital, Bhopal
Study duration: January 2018 to December 2018 [One year]
Sample size: 150 patients
Subjects and Selection Method: All cases of neoplastic and non-neoplastic diseases with pleural, ascitic, pericardial, peritoneal, ovarian ,synovial, cyst fluids and endometrial aspirates received in the department during that period were included in the study, rest other fluids were excluded.
Procedure Methodology: Complete patient history, clinical details and other relevant investigations of the patient were retrieved from cytopathology formfilled at the time of submission.3-4 slides were obtained in each case,previously wet fixed and stained by Haematoxylin and Eosin and Papanicolaou technique.The slides were then evaluated on light microscopy for Cellularity, Predominant cell type, Size, Architecture,Nuclear and Cytoplasmic features,Chromatin,Degree of inflammation,Reactive changes and other background features.The data so obtained was then summarized and analysed.

III. Results

Cytological analysis was done on 150 cases. The male to female ratio of these fluids specimens was 1:1.7 with 69 male patients and 81 female patients. The range of age group varied between newborns to 97 years of age with maximum cases in the age group of 51-60 years. So most common age group affected was 5th decade. Mean age of presentation in both the sexes was 48.2 years. The most common specimen was pleural

fluid with 75 cases[50%].The second most common fluid sent for pathological analysis was Ascitic fluid with35 cases [23.5%].The most common pathology noted in all the fluids was Infective/Inflammatory followed by malignancy. Few of the samples received were suboptimal for reporting.

Table No.1 : Age wise distribution of cases

AGE	PLEURAL	PERITONEAL	PERICARDIAL	SYNOVIAL	CSF
0-10	1	0	0	0	0
11-20	4	0	0	0	2
21-30	15	13	0	0	2
31-40	12	11	0	1	2
41-50	12	8	0	1	1
51-60	20	10	1	1	
61-70	7	10	1	1	1
71-80	2	8	1	0	0
81-90	2	0	0	0	0

Table no2: Gender wise distribution of cases.

GENDER	TOTAL CASES	PLEURAL	PERITONEAL	PERICARDIAL	SYNOVIAL	CSF
Male	69	29	33	2	2	3
Female	81	46	27	1	2	5

Table no 3: Distribution of effusions on cytological examinations.

Type of fluid	Lymphocytic effusion	Neutrophilic effusion	Malignant effusion	Inadequate	Total
Pleural	57	10	8	0	75
Peritoneal	40	7	13	0	60
Synovial	2	2	0	0	4
Pericardial	3	0	0	0	3
CSF	7	1	0	0	8

IV. Discussion

Lucke and Kiebs (1867} ,were among the pioneers of effusion cytology [10], who recognized atypical cells in ascetic fluid.Malignancy in pleural effusion was described by Quincke in 1882.CSF examination also began in 1891 in Germany following the introduction of lumbar puncture[10].Since then effusion cytology has gained tremendous importance the medical literature.

For decades ,body fluid analysis has played an important role as a diagnostic aid in establishing a definitive diagnosis , predicting prognosis and planning or monitoring therapy.It has gained increased acceptance in clinical practice today , since it is relatively simple , safe and inexpensive procedure [6].Thus the number of samples received in pathology laboratory is increasing and the clinicians use the effusion cytology report to diagnose and treat the underlying cause .The present study is undertaken to analyze the age and gender preponderance and cause of various types of effusion .In our study pleural fluid was the commonest fluid (75/150}followed by peritoneal (60/150}.Male to female ratio was 1 :1.17 .Most common non neoplastic lesion is chronic inflammation both in the pleural fluid and ascitic fluid . These lesions had a predominantly lymphocytic infiltrate in 90% of cases with 10 % having a combination of both lymphocytic and histiocytic infiltrate.These inflammatory exudates were caused by mostly infections of the organs enclosed by the serosal membranes or occasionally by tumors.Reactive mesothelial cells were also seen in few cases .In our study 21/ 150 cases were positive for malignant cells. Distinction was made on the basis of the cytological features of monolayered and two dimensional clusters of mesothelial cells in contrast to the large papillary three dimensional clusters of adenocarcinoma.Small groups of mesothelial cells exhibit typical window and also abnormal mitosis warrants a careful study to rule out malignancy.Special stains like Periodic acid Schiff stain was used to demonstrate PAS positive granules in the cytoplasm of mesothelial cells .Another stain which is useful for diagnosis is the mucin stain mucicarmine , which shows positivity only in adenocarcinoma and never in mesothelial cells .

Table no 4: Comparison of our study results with similar studies.

Studies	Pleural effusions			Peritoneal effusions			Pericardial effusions			Synovial effusion			Total
	Non malignant (%)	Malignant (%)	Total	Non malignant (%)	Malignant (%)	Total	Non malignant (%)	Malignant (%)	Total	Non suppurative (%)	Suppurative (%)	Total	
Shulbha et al [8]	93.6	6.4	94	97.7	2.3	174	NIL			25	75	8	385
Chakrabarti et al [7]	91.7	8.3	400	90.5	9.5	485	82.4	17.6	17	NIL			902
Kol P.C.et al [9]	77.6	22.4	76	77.7	22.3	103	100	0	01	NIL			180
Ayyagari et al [3]	83.8	16.2	148	72.8	27.2	125	75	25	08	33.3	66.6	21	302
Present Study	89.33	10.6	75	78.3	21.6	60	100	0	3	35	65	5	142

Figure 1. Lymphocytic Effusion

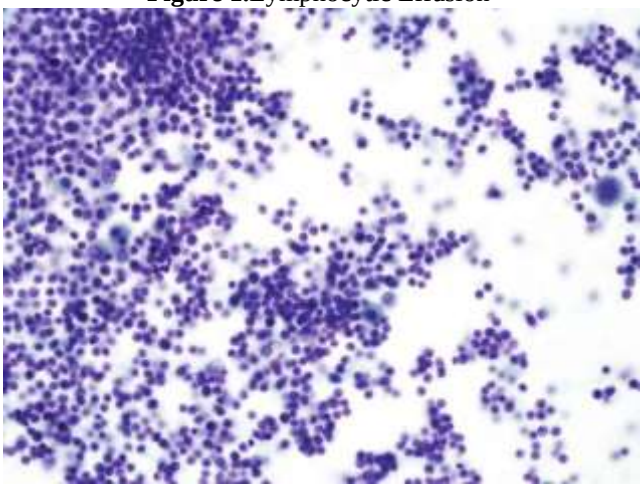


Figure 2. Purulent Effusion

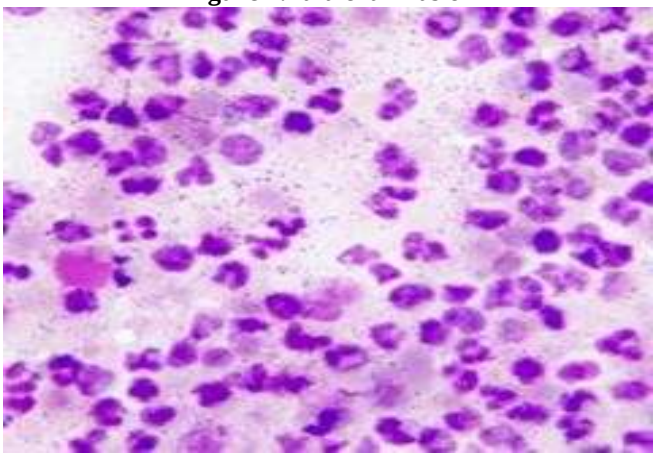


Figure 3. Malignant Effusion [Ovarian Carcinoma in Peritoneal fluid]

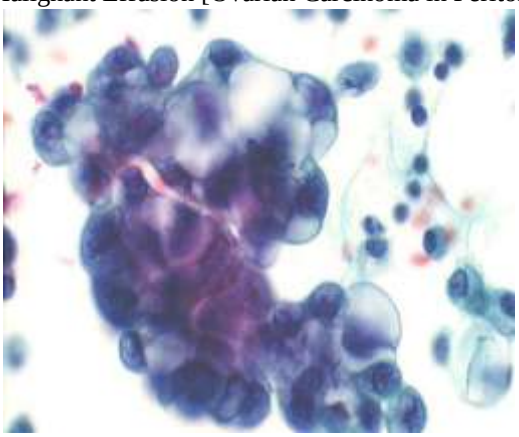
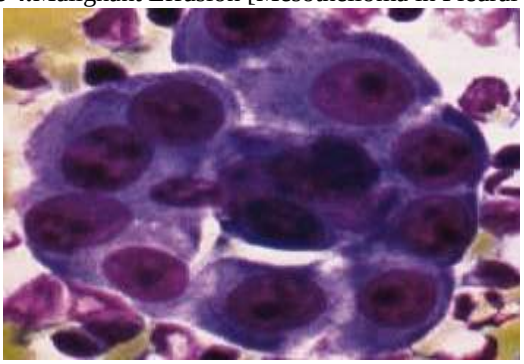


Figure 4. Malignant Effusion [Mesothelioma in Pleural Fluid]



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