ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 11 | November - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PATHOLOGICAL STUDY OF BODY FLUIDS IN A TERTIARY CARE CENTER IN SOUTH INDIA.

Pathology

Dr. Earla Lakshmi Bai Associate Professor Department of Pathology Osmania Medical College Hyderabad

Dr.Buddaiahgari Swathi Post Graduate Department of Pathology Osmania Medical College Hyderabad

Dr.Siva Chaithanya Bangi* Assistant Professor, Department of Pathology Osmania Medical College Hyderabad. *Corresponding Author

ABSTRACT

Body cavities fluid analysis is done routinely in both clinical pathology and cytology departments of Pathological laboratory. Any imbalance between fluid formation and removal leads to effusion, as stated by Starling's law[1.] The peritoneal, pleural, cerebrospinal and pericardial fluids comprise the major chunk of body fluids [2]. Accumulation of fluid in various body cavities can occur in vast range of benign conditions and it also a frequent clinical presentation and complication of malignant disorder.

METHODS: A prospective study was conducted in the Department of Pathology, Osmania general hospital Hyderabad, Telangana, India, during January 2020 to December 2020 and analyzed 880 fluid samples collected from patients for cell count and cytology. The data collected was tabulated using Microsoft excel and analyzed using standard statistical tools.

RESULTS - Of total 880 fluids analyzed peritoneal fluid (42%) constitutes the major type of fluid sent frequently for analysis followed by cerebrospinal fluid (41%) with male to female ratio of 1.9:1. 62.7% of fluids had clear gross appearance . Of total 880 fluid samples analyzed 649 samples (73.7%) had shown lymphocyte predominance. Of total 880 fluids samples analyzed 9 samples (1%) were found positive for atypical cells, confirmed on cytology suggesting there malignant origin.

CONCLUSION: fluid aspiration from body cavities constitutes one of the common day care procedures for clinicians. Effusion fluid analysis is key in delineating the background cause in the patient ranging from reactive, inflammatory and malignant conditions. Fluid cell count coupled by cytological analysis of fluids in pathology laboratory is a time tested tool having good sensitivity and specificity when interpreted along with biochemical parameters.

KEYWORDS

fluid analysis, cell count, fluid cytology

INTRODUCTION

Body cavities fluid analysis is done routinely in both clinical pathology and cytology departments of Pathological laboratory. Any imbalance between fluid formation and removal leads to effusion, as stated by Starling's law[1.] The peritoneal, pleural, cerebrospinal and pericardial fluids comprise the major chunk of body fluids [2].

Traditionally the fluid cell count is done by using hemocytometers. The hemocytometer rulings and counting grids have changed many times during its evolution. The counting grid designed by Thoma in 1879 was the foundation for earlier hemocytometer. But as the hematology field advanced, researchers realized that the counting grids were not appropriate for leukocyte measurement because they were mostly designed for counting the smaller red blood cells and platelets. In 1902, W. Türk added three more pairs of horizontal lines to Elzholz's design, thus making the counting grids similar to the ones at present time. This design replaced the initial Thoma cross grids until 1907, when O. Neubauer changed the lines to single instead of double to simplify the grid layout , which improved the clarity of the design and became the most used counting grid by 1922 [3].

MATERIALS AND METHODS

The present study was conducted in the Department of pathology, Osmania Medical College, Hyderabad on body fluids submitted for analysis during the period of January 2020 to December 2020.

Study design

Prospective study.

Method of collection of data

Source of Data

Digital records of clinical pathology and cytology department of pathological laboratory Osmania general hospital Hyderabad.

Sample size

880 fluid samples.

Selection criteria

INCLUSION CRITERIA

1. Patients with age more than or equal to 1month and less than or equal to 90years.
2. Pleural, peritoneal, cerebrospinal, synovial, and pericardial and CAPD fluids were included.

EXCLUSION CRITERIA

1. Samples which are inadequate.
2. Urine samples and semen samples.

Procedure

All the received samples were centrifuged for 2000-3000 rpm for 15 minutes, supernatant was discarded and both wet smears and air dried smears were prepared from the sediments. They were stained with Leishman, H& E and Papanicolau stain. Improved neubauer chamber was used for cell count. The data collected was tabulated using Microsoft excel and analyzed using standard statistical tools.

RESULTS

A total of 880 fluids were analyzed for total cell count and cytology. Of total 880 fluids 372(42%) samples were peritoneal, 364 (41%) were samples of cerebrospinal fluid, 131(15.5%) were samples of pleural fluid,8 (1%) were samples of synovial fluid and 5(0.5%) are categorized under others. In other category we had 3 pericardial fluids and 2 CAPD fluid samples.

The male to female ratio was 1.9:1. Of total 880 fluids 552 (62.7%) samples were clear, 295(30%) samples were hazy and 33(7.3%) were hemorrhagic on gross appearance.

Of 880 fluid samples analyzed 228(30%) were showing neutrophil predominance and 649(69%) were showing lymphocyte predominance and 9(1%) fluid samples showed atypical cells indicating underlying malignancy.

Among 131 pleural fluids analyzed 42(31%) were neutrophil predominant, 88(68.3%) were lymphocyte predominant, 1 (0.7%) showed atypical cells. The maximum age of collection of fluid was 85 years minimum age of collection was 2 months with mean age of 42yrs.

Among 372 peritoneal fluids analyzed 115(35.5%) were neutrophil predominant, 250(62.7%) were lymphocyte predominant, 7 (1.8%) showed atypical cells. The maximum age of collection of fluid was 75

years minimum age of collection was 3 months with mean age of 40.7yrs.

Among 364 peritoneal fluids analyzed 57(15.7%) were neutrophil predominant, 307(84.3%) were lymphocyte predominant. The maximum age of collection of fluid was 70 years minimum age of collection was 1 months with mean age of 18.7yrs.

Among 8 synovial fluids analyzed 7(87.5%) were neutrophil predominant, 1(12.5%) were lymphocyte predominant. The maximum age of collection of fluid was 65 years minimum age of collection was 15years with mean age of 34.8 yrs.

Among 5 fluids categorized under others 3 were pericardial fluids with one among them showing atypical cells and 2 samples were continuous ambulatory peritoneal dialysis fluid.

If we compare the mean values of the total cell count in the three major fluids the 66cells mean in cerebrospinal fluid is the lower followed by peritoneal fluid 346 cells and pleural fluid 634 cells.

DISCUSSION

Among the various types of fluids analyzed for cell count and cytology peritoneal fluids (42%) constitute the major sample share in the laboratory which was found in concordance with Shulbha V S, Dayananda B S study done on cytology of fluids[4].

62.7 percent of fluids were grossly clear in appearance indicating transudate type of effusions predominate exudate effusions.

As the lymphocytes are next common cells seen after mesothelial cells in body cavity fluids the lymphocyte predominate fluids constitute about 69%

Among 880 fluids analyzed 9(1%) showed atypical cells thus indicating 1% of all effusion constitute malignant effusions in the present study. This was higher 5.2% in Saba H, Prakash C.J., Sharmila P.S., Vinitra. K. study done on cytology of fluids for malignancy[5].

Among 9 fluids showing atypical cells 7(78%) were peritoneal fluid samples indicating the incidence of finding atypical cells of malignant origin is more in peritoneal fluids compared to other body fluids.

CONCLUSION

Fluid aspiration from body cavities constitutes one of the common day care procedures for clinicians. Effusion fluid analysis is key in delineating the background cause in the patients ranging from reactive, inflammatory and malignant conditions. Fluid cell count coupled by cytological analysis of fluids in pathology laboratory is a time tested and reliable diagnostic modality having good sensitivity and specificity when interpreted along with biochemical parameters.

TABLE – 1 Number of fluids as per type

	pleural	peritoneal	CSF	synovial	Oth.
male	90	271	210	7	2
female	41	101	154	1	3
total	131(15.5%)	372(42)	364(41%	8(1%)	5(.5)

Table – 2 Gross Appearance Of Fluids As Per Type

	clear	hazy	hemorrhagic	total
pleural	40	85	6	131
Peritoneal	204	154	14	372
CSF	307	48	9	364
Synovial	0	6	2	8
Others	1	2	2	5
total	552	295	33	880

Table – 3 Cell Predominance In Fluids As Per Type

	Neutrophil	lymphocyte	atypical	total
pleural	42	88	1	131
Peritoneal	115	250	7	372
CSF	57	307	0	364
Synovial	7	1	0	8
Others	1	3	1	5
total	228	649	9	880

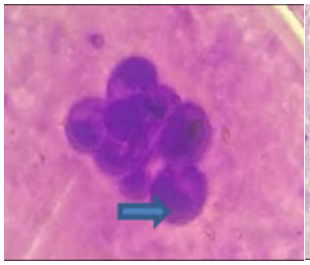

Fig: 1

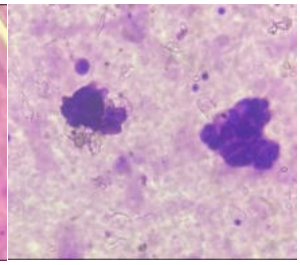

Fig: 2

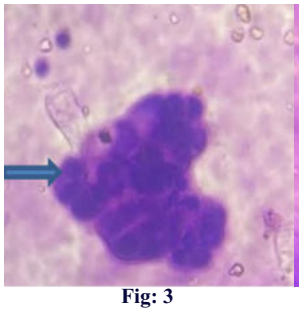

Fig: 3

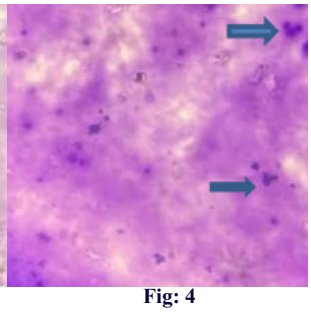

Fig: 4

Figure-1-atypically looking mesothelial cell cluster
Figure-2-low power 3D cluster of atypical cells
Figure-3- high power atypical cells adenoid-pattern
Figure-4- inflammatory fluid with neutrophils

REFERENCES:

[1] Kumavat PV, Kulkarni MP, Sulhyan KR. Cytological study of effusions. *Indian Med Gazette*. 2013;p. 306–13.
[2] Nguyen G. Essentials of fluid cytology. First edition ed.; 2009.
[3] Davis, j.d., the hemocytometer and its impact on progressive-era medicine, in Department of History1995, University of Illinois at Urbana-Champaign: Urbana. p. 268.
[4] Cytology of body fluids - an aid to primary diagnosis Shulbha V S, Dayananda B S Indian Journal of Pathology and Oncology, April-June 2015;2(2);81-83.
[5] Cytological study of body fluids for malignancy Saba H.1. Prakash C.J.2, Sharmila P.S.3, Vinitra. K.4 January, 2019/ Vol 5/ Issue 1 Tropical Journal of Pathology & Microbiology.