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Exfoliative cytology of body fluids: an analysis

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ABSTRACT

Background: Cytology can be studied on exfoliated cells or on cells aspirated by a needle. Body fluids are easily obtained by tapping i.e. pleural, peritoneal, same are subjected to biochemical and cytological examination. As an aid to the diagnosis, cytological evaluation of these fluids can be fruitful as observed largely. Present study is an attempt to analyze all the samples referred for cytological evaluation in a tertiary care hospital. **Materials and Method:** The present study is a descriptive, cross-sectional, analytical and retrospective type of study carried out in the department of pathology, of a tertiary care rural hospital over a period of one year from January 2015 to December 2015. Various body fluids such as peritoneal, pleural, cerebrospinal, etc were received in our department were studied under light microscope for cellular characteristics and classified in malignant and non-malignant entities. Improved Neubaeur's chamber was used for the cell counts. **Results:** A total of 414 body fluids were received in the one year period. Peritoneal fluid comprised of the majority of the cases with 189 (45.65%) cases followed by pleural fluid with 138 (33.34%) cases. Non-malignant diagnosis was given in majority of the cases. Slight male preponderance was noted with the mean age of presentation across all the patients being 46.6 years. **Conclusion:** Body fluid cytology is a rapid and simple diagnostic modality employed primarily for disease diagnosis in malignant and non-non-malignant cases. Meticulous examination with proper clinical correlation will go a long way in improving patient treatment and care.

Key words: Body fluid, Cytology, Malignancy

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 underlying disease process. Peritoneal, pleural, cerebrospinal and pericardial fluids comprise the major chunk of body fluids [1]. Normally, all the body cavities are lined by single layered epithelial cells and have minimal free fluid in them, for lubrication and protection of underlying viscera. Any imbalance between fluid formation and removal leads to effusion, as stated by Starling's law [2]. Various disease processes which include infectious, inflammatory and neoplastic entities give rise to effusion. Presence or absence of dysplastic or frankly malignant cells is a definitive guide to the disease progression. The overall cytological evaluation in the light of clinical, radiological and physical examination is an aid to the primary provisional diagnosis. Disease progression can be monitored whereas response of disease to treatment can be assessed with fair accuracy. Our study aims to analyse the various body fluids received in our department and correlate individual case clinically.

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Material and method

The present study is a descriptive, cross-sectional, analytical and retrospective type of study carried out in the department of pathology, of a tertiary care rural hospital over a period of one year from January 2015 to December 2015. Various body fluids such as peritoneal, pleural, cerebrospinal, etc were received in our department were centrifuged at 2500 rpm for 15 minutes, supernatants were discarded and sediments were smeared and stained. Two slides were air dried

and stained with Leishman while other two were fixed with methanol and stained with Haematoxylin & Eosin stains. Individual cells were studied under light microscope for cellular characteristics and classified in malignant and non-malignant entities. Improved Neubaur's chamber was used for the cell counts. Patient's history and clinical findings were collected from cytological requisition forms. All the data was then summarized and analyzed.

Observation

A total of 414 body fluids received in the period of one year. The age range varied from 11 to 86 years. Majority of the patients were in the 40 to 50 years of age group with mean age of presentation being 46.6 years. 208 cases (50.24%) were male which formed the majority. Females constituted of 206 cases (49.75%).We received cerebrospinal, sputum, pericardial, pleural, peritoneal and synovial fluids. All the fluids were classified on the basis of malignant and non-malignant characteristics. Cases in which no opinion was possible due to acellularity, inadequate sampling, and degenerative changes were also noted. Among all fluids, peritoneal fluid comprised of maximum number of cases with 189 (45.65%) followed by pleural fluid with 138 cases (33.34%). The next most frequently encountered fluid was cerebrospinal fluid (CSF) with 64 (15.15%) cases. On evaluation, a total of 31 (7.48%) cases were found to be malignant, of which 18 (4.34%) were encountered in peritoneal fluid whereas 13 (3.14%) were found in pleural fluids. No other fluid showed malignancy other than these. We also received 10 (2.41%) cases of sputum of which 09 (2.17%) were non-malignant whereas no opinion was possible in a single case. Of the 07 pericardial fluids we received 05 (1.20%) cases which were non-malignant while no opinion was possible in 02 cases[Table 1].

Table 1: Distribution of cases according to diagnosis

Diagnosis	Non-malignant	Malignant	No opinion possible	Total	Percentage
Fluids					
CSF	52	-	12	64	15.45%
Sputum	09	-	01	10	2.41%
Pericardial	05	-	02	07	1.69%
Pleural	117	13	08	138	33.34%
Peritoneal	157	18	14	189	45.65%
Synovial	04	-	02	06	1.44%
Total	344	31	39	414	

Of the 64 cases of CSF opinion was not possible in 12 (2.89%). Of the 52 non-malignant diagnoses of CSF 21(5.07%) showed normal findings, 08 (1.93%) cases showed polymorphic cell infiltration indicating bacterial meningitis, 03 (0.72%)cases showed cryptococcal meningitis while 20 (4.83%) cases showed features of viral meningitis. We received 06 cases of synovial fluids, none of which were malignant. Across both sexes, pleural fluid was the most common fluid to be tapped followed by peritoneal fluid. On further evaluation of gross appearances of fluids received, 37 (8.93%) cases of CSF, 40 (9.66%) cases of pleural fluid, 111 (26.81%) cases of peritoneal and 03 (0.72%) cases of synovial fluid were clear in appearance. 23 (5.56%) cases of CSF,07 (1.69%) cases of pericardial, 02 (0.48%) cases of synovial fluid, 36 (8.69%) cases of pleural fluid and 68 (16.42%) cases of peritoneal hemorrhagic fluid in nature. Turbid appearance was noted most commonly in pleural fluid with 62 (14.97%) cases followed by 10 (2.41%) cases of peritoneal fluid and a single (0.24%) case of synovial fluid. [Table 2]

Table 2: Individual case characteristics of various fluids

Clinical Features	Fluids					
	CSF	Sputum	Pericardial	Pleural	Peritoneal	Synovial
Mean age(Years)	44.1	48.7	45.4	51.8	52.3	37.4
Male	34	08	04	62	96	04
Female	30	02	03	76	93	02
Gross Appearance						
Clear	37	-	-	40	111	03
Haemorrhagic	23	-	07	36	68	02
Turbid	04	-	-	62	10	01
Total	64	-	07	138	189	06

Transudates comprised of 242 (58.45%) cases among all fluids. Peritoneal fluid with 118 (28.50%) cases had the highest frequency of transudate, followed by 60 (14.49%) cases of cerebrospinal fluid, 45 (10.86%)

cases of Pleural fluid and 05 (1.20%) cases of synovial fluid.Out of 414 cases, 172 (41.54%) cases had exudative effusion. Majority of them were pleural fluid with 93 (22.46%), followed by 71 (17.14%) cases of peritoneal fluid,04 (0.96%) cases of CSF and 03 (0.72%)cases of sputum and a single case (0.24%) of synovial fluid.

Discussion

Lucke and Kiebs (1867), were among the pioneers of effusion cytology. [1] They are credited with the description of atypical or malignant cells in the ascitic fluid. Malignancy in pleural effusion was first described by Quincke in 1882. After the introduction of lumbar puncture in 1891, CSF examination gained momentum. [1] Over the years different pathologies have come across in the literature, which are potential etiologies for effusions. Owing to these facts it is imperative that exact diagnosis of the underlying disease is known. Aspiration of body fluid is a simple, economical, quick and patient compliant procedure. In addition to cytological evaluation, biochemical and microbiological analysis of these fluids is also important.In our study, males and females had almost equal incidence with males 208 (50.24 %) cases being slightly more than female 206 (49.75%) cases. Majority of the cases were in 40-50 age group with mean age of presentation being 46.6 years. Our study was in concordance with studies done by Shulbha et al, Pradhan et al and Joshi et al. [3,4,5]Peritoneal fluid was the most frequently encountered effusion with 189(45.65%) cases followed by pleural fluid with 138 (33.34%) cases. A total of 31 (7.48%) cases were malignant and 344 (83.09%) cases were non-malignant in our study. Our findings were in concordance with other studies. [3, 4, 5] Maximum cases were transudates in our study with 242 (58.45%) cases whereas exudates constituted of 172 (41.54%) cases. Kumavat PV et al stated similar findings. [2] We encountered 03 (0.72%) cases of cryotococcal meningitis. India ink preparation was employed for identification of cryptococci. Cryptococcal meningitis is the most common opportunistic CNS infection in India. [6,7]. In our study, majority of the malignancies were found in the peritoneal fluid with maximum cases being adenocarcinoma. In a study done by Wong JW et al, pleural fluid was found to have the highest positivity for malignant cells amongst all fluid [8]. However Jha R et al, found adenocarcinoma as the most common finding among all fluids. [9] Our study was in agreement with other studies.Hemorrhagic fluid raises suspicion of malignancy as was found in our study with majority of malignancies presenting as haemorrhagic fluid. Presence of malignant cells in the effusion worsens the prognosis.

Conclusion

Cytological evaluation of body fluids is a definite aid to the treating physician. It is a simple and safe investigation which helps in understanding disease progression. Furthermore, studies such as tumor markers can be done of fluid, which can help in accurate diagnosis and alleviate patient's morbidity and mortality.

References

1. Nguyen G. Essentials of fluid cytology.2009:9-71.
2. Kumavat PV, Kulkarni MP, Sulhyan KR. Cytological study of effusions. Indian Medical Gazette.2013;August:306-313.
3. Shulbha VS, Dayananda B.Cytology of body fluids-an aid to primary diagnosis. Indian journal of PatholmOncol.2015;2(2):81-3.
4. Pradhan SB, Pradhan B, Dali S. Cytology of body fluids from different sites: an approach for early diagnosis of malignancy. J Nepal Med assoc.2006;45(164):353-6.
5. Joshi A, Mahajan N, Karmarkar PJ. Diagnostic utility of various techniques used in body cytology. J Dent Med Sci.2014; 13(1):13-8.
6. Aslam SMS, Chandrasekhara P. Study of Cryptococcal Meningitis HIV Seropositive Pateints In a tertiary care centre.2009;10(3):110-115.
7. Kothavade RJ, Oberai CM, Valand AG, Panthaki MH. Disseminated cryptococcosis and fluconazole resistant oral candidiasis in a patient with acquired immunodeficiency syndrome (AIDS). J Infect Dev Ctries.2010;4(10):674-678.
8. Wong JW, Pitlik D, Abdul Karim FW. Cytology of pleural, peritoneal and pericardial fluids in children. A 40 years summary. Acta cyto .1997;41(2):467-476.
9. Jha R, Shrestha HG, Sayami G, Pradhan SB. Study of Effusion Cytology in patients with simultaneous Malignancy and ascitis. Kathmandu University Medical Journal.2006; 16(4):483-487.

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