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Short Communication

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Histopathological Types of Exudate Pleural Effusion with Lymphocytosis

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ABSTRACT

Pleural biopsy is very important procedure to diagnose a exudative pleural effusion with dominant mononuclear cell count (or lymphocytes) >50% of the differential leucocyte cells in pleural fluid. The main histopathological types as in our cases were the first cause is TB pleuritis with effusion form 42% which more common in female (53%), with mean age is 39 years, the second cause is metastatic malignant effusion form 29% which is more common in males (87%), with mean age is 62 years, and the most common histopathological type is metastatic adenocarcinoma form 67% of all cases, while malignant mesothelioma is a rare cause of malignant pleural effusion, also chronic nonspecific inflammations form 29% of all cases.

Keywords- *Pleural effusion, Tuberculosis, Malignant.*

INTRODUCTION

Pleural effusion is a common disease in our hospital which usually either exudates or transudates according to Light criteria[1] this differentiation is very important for diagnosis and treatment. The aim of this study to look for the causes of exudative pleural effusions with dominant >50% lymphocytes (mononuclear cells) of the differential cell count of pleural effusion, age distribution, mean age, sex, and the histopathological types of malignancy pleural effusions.

MATERIALS AND METHODS

A retrospective study of 41 patients 26 (63%) are male and 15 (37%) are female admitted with pleural effusion. All these patients have exudative pleural effusion according to Light criteria[1] with lymphocytosis, had blind Pleural biopsy done by Abrams needle[2,3,5] sent for histopathology and pleural fluid sent for cytology for malignant cells preserved in highly concentrated alcohol.[4] If pleural fluid is hemorrhagic 1 ml heparin is added to 50-60 ml syringe to prevent clotting of pleural fluid.[5]

RESULTS

A 41 patients admitted with pleural effusion of exudative type with lymphocytosis the main histopathological types (Figure 1) were :

1.Tuberculosis (TB) pleuritis (42%)

2. Malignancy (29%)

3. Chronic nonspecific inflammations (29%).

The age distribution of these three histopathological types shown in figure-2 , The mean age of exudative pleural effusion shown in figure-3, while the sex distribution of exudative pleural effusions shown in figure-4.

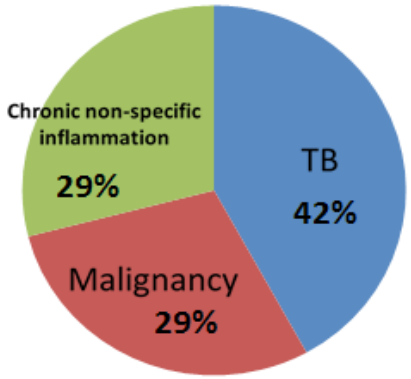

Figure 1: The main histopathological types of exudative pleural effusion

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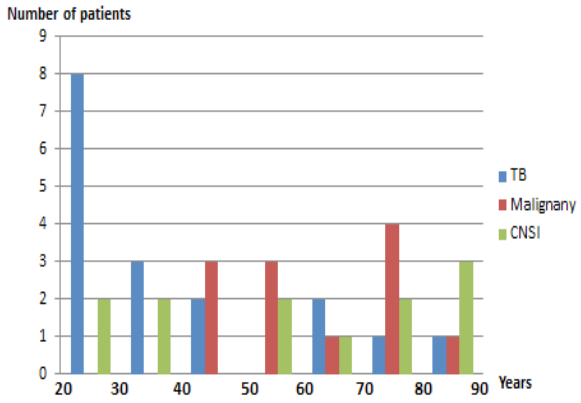

Figure 2: The age distribution of these three histopathological types

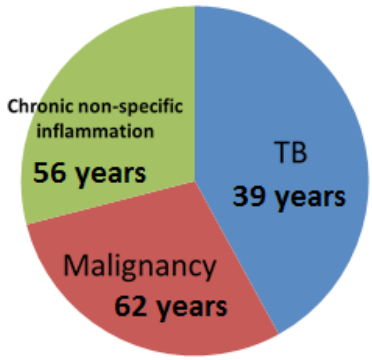

Figure 3: The mean age of exudative pleural effusion

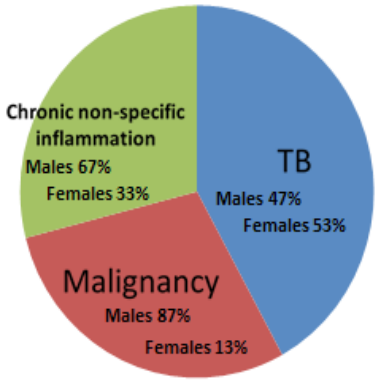

Figure 4: The sex distribution of exudative pleural effusions

The age distribution of malignant pleural effusions effusion shown in figure-5 are:

(1)-Adenocarcinomal (67%), (2)-Small cell carcinoma (33%). The mean age group of malignant pleural effusion shown in figure-6, while the sex distribution shown in figure-7.

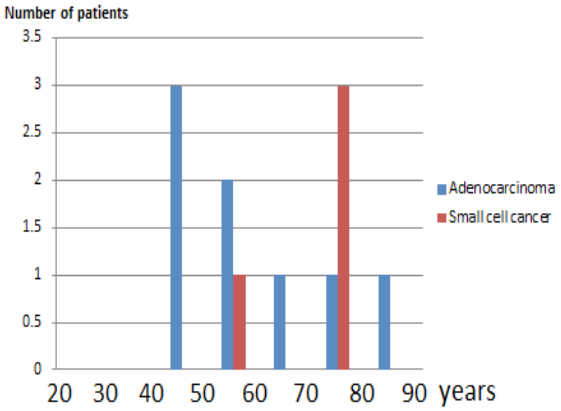

Figure 5: The age distribution of malignant pleural effusions

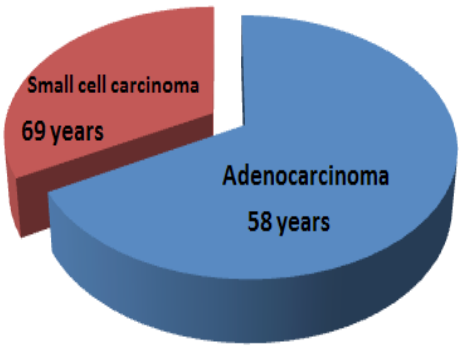

Figure 6: The mean age of malignant pleural effusion

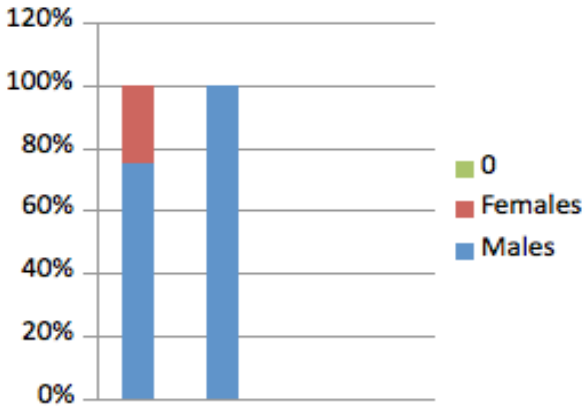

Figure 7: The sex distribution

Results of histopathology and cytology of malignant pleural effusion:

- A 4 out from 8 patients who have positive results of histopathology, have also positive result of cytology for malignant cells.

- A 4 out from 8 patients with positive results of pleural biopsy have negative result for malignancy in cytology.

- One patients who had chronic nonspecific inflammation of histopathology had positive result for malignancy in cytology.

- While one patients diagnosed as pleural carcinoma in pleural biopsy, the definitive pathological type was diagnosed by cytology as shown in (Table1).

Table 1: Results of pleural biopsy and cytology of malignant pleural effusion

Case	Biopsy result	Cytology result
1	Aenocarcinoma	-ve
2	Adenocarcinoma	-ve
3	Adenocarcinoma	NA
4	Adenocarcinoma	NA
5	Adenocarcinoma	Positive for malignancy
6	Pleural carcinoma	Positive for malignancy-Adenocarcinoma
7	Adenocarcinoma	NA
8	Adenocarcinoma	NA
9	Small cell carcinoma	Positive for malignancy
10	Chronic nonspecific inflammation with fibrosis	Positive for malignancy -Small cell carcinoma
11	Small cell carcinoma	-ve
12	Small cell carcinoma	-ve

NA = Not Available

DISCUSSION

Pleural biopsy and pleural fluid for cytology both are important procedures for diagnosis of histopathological type and cause of exudative pleural effusion with lymphocytosis. Although these two procedures diagnosed TB pleuritis with effusion in 42% of patients, which usually seen more in younger age group females, and malignant effusion in 29% of patients seen more commonly in older male patients, still there are about 29% of cases the result of their histopathology were chronic nonspecific inflammation, in these patients they need more work up to reach to the specific cause of the pleural effusion, and to take samples of pleural tissues either by medical or surgical thoracoscopy (the prefer procedure) or thoracostomy and open biopsy by thoracotomy. Patients with malignant effusion who have positive results on histopathology by pleural biopsy, only 50% also have positive result of cytology for malignant cells, while other patients with malignant effusion with positive results of pleural biopsy 50% of them have negative result for malignancy in cytology.

A 12.5% of patients were diagnosed as chronic nonspecific inflammation on histopathology had positive result for malignancy in cytology.

A 12.5% of patients diagnosed as pleural carcinoma in pleural biopsy, the definitive pathological type was diagnosed by cytology.

Metastatic adenocarcinoma is the most common types of malignant pleural effusion forming 2/3 of cases, and their mean age is 58 years, while small cell carcinoma is the second type forming 1/3 of cases and their mean age is 69 years.

Males with malignant pleural effusion forming (87%) of all cases while females only (13%).

No one case of malignant pleural effusion recorded in this series to have malignant mesothelioma. Why? May due to the following reasons:

- Small number of malignant effusion cases in this serious.

- It is a rare disease, e.g. in USA incidence is approximately 11.4/1,000,000 in male and 2.8/1,000,000 in female.[6]

- Lack of one of the important risk factors, i.e. prior exposure to asbestose.g. mining, shipping. The percentage of patients with mesothelioma who have history of occupational exposure to asbestos ranges from 10% in Myoclinic series[7] to 70% in, New England, England, and South Africa series.[8] The interval between the first exposure to asbestos and the emergence of the tumor is usually 20 to 40 years.[9]

Pathological features: Histologically malignant mesotheliomas are classified as epithelial type which can resemble metastatic adenocarcinoma to the pleura,to differentiate between them it needs immunohistochemical stains, there are shortage in these special type of stains, while mesenchymal (fibrous) type which resembles spindle-shaped sarcoma, or mixed type which reveals features of both the epithelial and mesenchymal forms[10], the more separate biopsies obtained, the more likely for the tumor to be classified as mixed.[11]

Problems of sample: Needle biopsy of pleura is usually not diagnostic of malignant mesothelioma. In one serious, the needle biopsy to differentiate between them was diagnostic of mesothelioma only in 21%.[12] More invasive procedures are necessary to provide larger samples for definitive diagnosis, therefore sometimes diagnosis must be made with thoracoscopy (choice procedure) or thoracotomy and open biopsy[13,14], which either not available or available and under used.

- Lack of the facilities to localize the active site of the tumor which guide the proper site of biopsyto provide positive histopatholgical diagnosis for malignant mesothelioma, and avoid fibrous tissue area which give false negative results. PET scan very helpful in this issue.[15] PET can help distinguish among differential diagnoses[15]:

a. Solitary Fibrous tumor of the pleura (FTP) usually low

PET activity.

b. Pleural plaques and fibrosis should be negative.

c. Metastatic disease should be revealed.

d. Mesothelioma usually strongly positive.

Because of high number of cases (29%) have diagnosis of nonspecific inflammation in pleural biopsy, we need another methods to improve yield results of pleural biopsy like CT scan-guided Abrams pleural needle biopsy (CT-ANPB) and medical thoracoscopy for diagnosis of patients with pleural effusions. In Metintas *et al* study using these two methods, in the CT-ANPB group, the diagnostic sensitivity was 87.5%, as compared with 94.1% in the thoracoscopy group. Conclusion of this group, they recommended using CT-ANPB as the primary diagnostic procedure in patients with pleural thickening or lesions observed on CT scans, and using medical thoracoscopy in patients whose CT scans demonstrate only pleural fluid, as well as in those who may have benign pleural pathologies other than TB.[16] Because positive results of blind biopsy by Abrams needle for cases of TB pleuritic with effusion is high as obtained in a study by Pandit *et al* using the Abrams needle, pleural biopsy tissue yielded the diagnosis of tuberculosis in 90.9% of cases.[17]

CONCLUSION

The first common cause of exudate pleural effusion is TB pleuritis with effusion forming 42%, while second cause is metastatic malignant pleural effusion which forming 29%. The mean age group of TB pleuritis with effusion is 39 years (younger age), while malignant pleural effusion is 62 years (older age). TB pleuritis with effusion is more common in females whilemalignant effusion is more common in males. Males with malignant pleural effusion forming (87%) of all cases while females only (13%). The most common type of metastatic tumor to the pleura is adenocarcinoma which forming 67% of all cases. Patients with positive results of pleural biopsy have 50% chance to have positive or negative result for malignancy in cytology. While 12.5% of patients have chance to have positive result of pleural biopsy, or positive result of cytology for malignancy.

RECOMMENDATIONS

Therefore it is recommended for any patient with exudative effusion with lymphocytosis to do both pleural biopsy for histopathology and pleural fluid for cytology for malignant cells, to get more chance to have positive results. Because of large number (29%) of cases have chronic nonspecific inflammation with blind pleural biopsy by Abrams needle, they need more investigative procedures or methods to improve biopsy results to reach to the specific cause of the pleural effusion. Methods to improve yield results of pleural biopsy are CT scan-guided Abrams needle pleural biopsy (CT-ANPB) for patients with pleural thickening or lesions observed by CT scan, while in patients with only pleural fluid appearance on CT scan and in those who may have benign pleural pathologies as TB pleuritis which forming most common cause of cases (42%) the primary method of diagnosis should be blind Abrams pleural needle biopsy if negative result, then domedical thoracoscopy or thoracotomy for diagnosis of these patients with pleural effusions of undiagnosed cause.

REFERENCES

1. Light RW, MacGregor MI, Luchsinger PC and Ball WC (1972) Pleural effusions: the diagnostic separation of transudates and exudates, *Ann Intern Med*. **77**, 507-513.

2. Mestiz P, Purves MJ and Pollard AC (1958) Pleural biopsy in diagnosis of pleural effusion, *Lancet* **2**, 1349-1353.

3. Von Hoff DD and LiVolsi V (1975) Diagnostic reliability of needle biopsy of the parietal pleura, *Am J Clin Pathol*. **64**, 200-203.

4. Spriggs AI and Boddinggton MM (1968) The cytology of effusions 2nd ed. New York: Grune and Stratton.

5. Richard W(1995) *Pleural disease, Jpn J Cancer Research* **86**, 92933.

6. Connelly RR, Spirtus R, Myers MH, *et al*. (1987) Demographic patterns for mesothelioma in United states, *JNCI* **78**,1053-1060

7. Oels HC, Harrison EG Jr , Carr DT and Bernatz PE (1971) Diffuse malignant mesothelioma of the pleura: a review of 37 cases, *Chest* 60, 564-570.

8. Antmana KH (1981) Clinical presentation and natural history of benign and malignant mesothelioma, *Semin Oncol* **8**, 313-320.

9. Aisner J and Wiernik PH (1978) Mlaignant mesothelioma: current status and future prospects, *Chest* **74**, 438-444.

10. Suzuki Y (1981) Pathology of human malignant mesothelioma, *Semin Oncol* **8**, 268-282.

11. Lewis RJ, Sister GE and MacKenzie JW (1980) Diffuse, mixed malignant pleural mesothelioma, *Ann Thorac Surg*. **31**, 53-60.

12. Menzies R and Charbonneau M (1991) Thoracoscopy for the diagnosis of pleural disease, *Ann Inten Med*. **114**, 271-276.

13. Law MR, Hodson ME and Turner-Warwick M (1984) Malignant mesothlioma of the pleura: clinical aspects and symptomatic treatment, *Eur J Respir Dis*. **65**, 162-168.

14. Hucker J, Bhatnagar NK, Al-Jilaihawi AN and Forreter-Wood CP (1991) Thoracoscopy in the diagnosis and management of recurrent pleural effusions, *Ann Thorac Sur*. **114**:271-276.

15. Menzies R and Charbonneau M (1991) Thorascopy for the diagnosis of pleural disease, *Ann Intern Med*. **112**, 271-276.

16. Kruse *et al*. (2013) *FDG PET/CT in the management of primary pleural, AJR* **201**, W215-226.

17. Metintas M, Ak G, Dundar E, *et al*. (2010) Medical thoracoscopy vs CT scan-guided Abrams pleural needle biopsy for diagnosis of patients with pleural effusions: a randomized, controlled trial, *Chest*. **137**(6), 1362-1368,

18. Pandit S, Chaudhuri AD, Datta SB, Dey A and Bhanja P(2010) Role of pleural biopsy in etiological diagnosis of pleural effusion, *Lung India* **27**(4), 202-204.