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Research Article

Clinical Profile of Patients with Malignant Pleural Effusion

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ABSTRACT

Introduction: *Pleural effusion (PE) refers to the excessive or abnormal accumulation of fluid in the pleural space. Approximately one-fourth of all PE and 30 - 70% of all exudative effusions in hospital settings are secondary to cancer. The present study was conducted with the objective of identifying the relative proportion of different malignancies and clinical profile of patients with malignant PE.*

Materials & Methods: *A total of 89 consecutive cases ≥ 18 years having pleural effusion with proven underlying malignancy were included in a hospital based observational study. Detailed clinical history, general and systemic examination was done in all patients. A chest radiograph was done and the size of effusion was estimated in all cases.A diagnostic thoracentesis was then performed on all patients and biochemical and cytological examination was done on the aspirated pleural fluid.*

Results: *The mean age of study subjects was 59.06± 15.53 years with male to female ratio was 1.02:1. Most common organ involved was lung (43.8%), carcinoma breast (15.73%) and carcinoma ovary (14.6%). Histopathologically adenocarcinoma was most common accounting for 28.1%, followed by squamous cell carcinoma were 22.5%. All malignant pleural effusion were exudative in nature. Large effusion was seen in 53.9% cases. Pleural fluid appearance was more commonly found to be haemorrhagic (50.56%). Pleural fluid cytology was positive for malignant cells in 68.5% cases.*

Conclusion: *Malignant effusions are more common in age group of above 50 years and are mostly exudative effusions. These are most commonly associated with malignancies of lung followed by breast, ovary, cervix and lymphomas.*

Keywords: *Clinical Profile, Lung Carcinoma, Malignant Pleural effusion, Pleural fluid cytology.*

INTRODUCTION

Pleural effusion (PE) refers to the excessive or abnormal accumulation of fluid in the pleural space. PE is commonly encountered medical problem and caused by a variety of underlying pathological conditions[1]. They are classified broadly in to exudative and transudative effusion based on Light's criteria[2]. Common causes of transudative effusions are congestive cardiac failure, cirrhosis, nephrotic syndrome, superior

venacava obstruction, peritoneal dialysis, glomerulonephritis, myxoedema, pulmonary emboli and sarcoidosis whereas exudative PE is caused by neoplastic diseases, infections, pulmonary embolism, gastrointestinal diseases, collagen vascular diseases, drug induced, iatrogenic, hemothorax and chylothorax.

Approximately one-fourth of all PE and 30 - 70% of all exudative effusions in hospital settings are secondary to cancer [2]. Lung cancer is the most common metastatic tumor to the pleura in men, while breast cancer is the most common tumor in women [3]. Together, both cancers account for 50 - 65% of all malignant effusions. Lymphomas and tumors of the genitourinary and gastrointestinal (GI) tracts account for a further 25% [3,4]. The incidence of pleural effusion in Hodgkin's disease and non-Hodgkin's lymphoma is about 7 - 16%. Pleural effusions from an unknown primary are responsible for 7-15% of all malignant pleural effusions [4].

In patients with cancer, only 50 to 60% of all effusions are positive on first thoracocentesis [5,6]. In approximately one-fourth of the patients with cancer and a recurrent pleural effusion, malignant cells may not be found on examination[6]. Pleural biopsy, either blind or under ultrasonography (USG) or computed tomography (CT) guidance can help in a few patients. Medical thoracoscopy or pleuroscopy with pleural biopsy may yield higher results. The prognosis associated with malignant pleural effusion is generally poor. After the diagnosis of malignant pleural effusion, the mean survival is only 3 - 12 months [3,7].

The present study was thus planned to identify the relative proportion of different malignancies and clinical profile of patients with malignant PE.

MATERIAL AND METHODS

Type of study: Hospital Based Observational Study

Study duration: From May 2012 to December 2014.

Study population: A total of 89 consecutive cases ≥ 18 years having pleural effusion with proven underlying malignancy were included in the study.

Inclusion criteria

1. Patients ≥18 years of age
2. Clinically and radiologically diagnosed as having pleural effusion due to any underlying malignancies, irrespective of sex.

Exclusion criteria

1. Patients having pleural effusion due to etiologies other than malignancy
2. Patients not willing to give written informed consent

Methodology

Detailed clinical history, general and systemic examination was done in all patients. A chest radiograph was done and the size of effusion was estimated in all cases. If the size of effusion was more than 2/3rd, it was considered large/ massive effusion. After preliminary examination and investigations, an informed consent was taken from all the patients regarding diagnostic thoracentesis.

Further, every study participant was subjected to following investigations: pleural fluid cytology, pleural fluid LDH, pleural fluid proteins, S. proteins and S. LDH. The exudative pleural effusions meet at least one of the following criteria, whereas transudative pleural effusions meet none (Light's criteria):

1. Pleural fluid protein divided by serum protein greater than 0.5
2. Pleural fluid LDH divided by serum LDH greater than 0.6
3. Pleural fluid LDH greater than two thirds of the upper limit of normal serum LD

A diagnostic thoracentesis was then performed on all patients. Patient were positioned as recommended by RW Light[2] where the patient sits by the side of the bed with arms and head resting on one or more pillows on a bedside table, with a footstool placed below for footrest. Patient was positioned to sit near the foot of the bed with side containing the fluid toward the foot of the

bed. The back should be vertical. With this position fluid was aspirated. Thoracocentesis was performed inthe mid axillary line, one inter space below the dull tactile fremitus and also confirming the exact location with the help of chest radiograph. Chest ultrasound was used if the effusion was very small and difficult to diagnose by percussion.

The site of thoracentesis was identified, and marked with the end of a ballpoint pen with tip retracted. The area was cleaned with povidone iodine and then surgical spirit4 inches from the mark, all around. Sterile drape with a central hole was then placed and other sterile drape was placed on the bed. Skin, the periosteum, and parietal pleura were anesthetized with xylocaine, using 25-guage needle. 50ml syringe was used with a 22-guage needle and fluid was aspirated, with 1ml of heparin in it to prevent clotting of the fluid. Ultrasound guided thoracentesis was done if fluid was not obtained. Patients were observed once theprocedure was completed for any evidence of pneumothorax. If the clinical suspicion was high, chest X-ray was done and necessary intervention was done, where indicated.

A total of 15 ml pleural fluid was collected, 5 ml was sent to biochemistry department for estimation of protein and lactate dehydrogenase while 10 ml was sent for cytological examination.

Statistical Analysis

Collected data was entered in Microsoft Excel sheet- 2010 and then transferred and analyzed using SPSS software ver. 21 using appropriate statistical tests.

RESULTS

The mean age of study subjects was 59.06± 15.53 years with 50.56% were males and male to female ratio was 1.02:1. Most common symptoms were cough (61.20%) followed by breathlessness (22.41%). Most common organ involved was lung(43.8%), carcinoma breast (15.73%) and carcinoma ovary (14.6%) (Table 1). Histopathologically adenocarcinoma was most common accounting for 28.1%, followed by squamous cell carcinoma were 22.5% (Table 2). All malignant pleural effusion were exudative in nature. Large effusion was seen in 53.9% cases. Pleural fluid appearance was more commonly found to be haemorrhagic (50.56%). Pleural fluid cytology was positive for malignant cells in 68.5% cases.

Table 1. Distribution of patients according to Organ Involvement

Organ Involved	n	%
Lung	39	43.8%
Breast	14	15.7%
Ovary	13	14.6%
Cervix	8	9.0%
Lymphoma	7	7.9%
Colon	7	7.9%
Rectum	1	1.1%
Total	89	100.0%

Table 2. Distribution of patients according to Histopathological Diagnosis

Histopathology	n	%
Adenocarcinoma	25	28.1%
Squamous Cell Carcinoma	20	22.5%
Invasive Carcinoma	14	15.7%
Papillary Serous Cystadenocarcinoma	10	11.2%
Small Cell Carcinoma	10	11.2%
Hodgkin's Lymphoma	5	5.6%
Mucinous Cystadenocarcinoma	3	3.4%
Non-Hodgkin’s Lymphoma	2	2.2%

DISCUSSION

Malignant pleural effusions are a troublesome and debilitating complications of advanced maligna-ncies. In this descriptive study of 89 patients with malignant pleural effusion, the mean age was 59.06± 15.53 years. Our study is comparable to the study done by Jobin et al. [8], were most of the cases were between the age group of 41-60 years (mean 52 years),and also to the study done by Zaysoe et al. [9], which showed mean age group of 63.45 years. But the mean age is more than that reported by Sharma et al. [10] (mean age 47 years).

Amongst eighty nine consecutive patients, 45 were males and 44 were females giving a male to

female ratio of 1.02:1.This ratio is slightly less than the study done by Zaysoe et al. [9], which showed male to female ratio of 1.43:1.

The most common symptoms encountered in our patients were cough (61.20%) followed by breathlessness (22.41%), chest pain (13.79%)and fever (2.58%).Our findings were comparable to study of Zaysoe et al.[9] which showed breathlessness and cough as common symptoms contributing 86.3% each followed by chest pain (72.6%). Patients with malignant effusion had breathlessness as a common symptom (51%) in a study byJobin et al. [8].

Most common organ involved is lungs(39 cases out of 89) that is 43.8%,followed by carcinoma breast(15.73%) and carcinoma ovary (14.6%) which is comparable to study done by Jose Manuel et al. [11], where out of 89 malignant cases, lung carcinomas were 28 cases (32.58%), breast carcinoma 19 cases (21.34%), followed by haematological and gynaecological carcinoma (7.8% each) and gastrointestinal tumours (5.6%). Considering histopathology of underlying malignancy, amongst all MPE cases adenocarcinoma was most common accounting for 25 (28.1%),followed by squamous cell carcinoma were 20 cases (22.5%), invasive carcinoma of breast were 14 cases (15.7%), papillary serous cystadenocarcinoma were 10 cases(11.2%),small cell carcinoma were 10(11.2%), Hodgkins lymphoma were 5 cases(5.6%), mucinous cystadenoma were 3 (3.4%) cases and non Hodgkins lymphoma was seen in 2 cases (2.2%). As lung carcinoma is the most common carcinoma causing MPE, amongst its histological types-adenocarcinoma (43.59%) was common followed by squamous cell carcinoma (30.7%) and small cell carcinoma (23.07%).

Similar finding were shown in studies done by with Chernow B et al.[12] and CantóAet al. [13], which demonstrated adenocarcinoma as the commonest histopathological type causing MPE in lung carcinoma.

We also observed that massive effusion was seen in 53.9% cases, similar to that observed by Jobin et al. [8] which showed malignant pleural effusion contributing to massive effusion in 51.6%cases and in study done by Maher et al. [14] it was55.4% cases. In present study, pleural fluid appearance was more commonly found to be hemorrhagic (50.56%) than straw coloured pleural effusion (49.43%). This was similar to the study done by Zaysoe et al.[9] which showed hemorrhagic effusion in 47.9%malignant cases and straw coloured in 52.1% cases.

Pleural fluid cytology was performed in all the patients, among them 68.5% were positive for malignant cells, which was more than observed by Jobin et al.[8], who showed only 51.6% of the effusion were positive for malignant cells on cytological examination. In other studies the percentage demonstrating malignant cells ranged from 40% to 87% [15]. In the literature cytology is a more sensitive test to diagnose malignancy as compared to biopsy.

CONCLUSION

Malignant effusions are more common in age group of above 50 years and are mostly exudative effusions. These are most commonly associated with malignancies of lung followed by breast, ovary, cervix and lymphomas. Massive effusion were commonly associated with lung carcinoma while pleural fluid cytology was positive in 68.5% cases.

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