How to Cite:
Koppu, M. D. (2022). A descriptive study of clinical profile of malignant pleural effusions in a tertiary care centre. *International Journal of Health Sciences*, *6*(S4), 11518–11523. https://doi.org/10.53730/ijhs.v6nS4.11171

A descriptive study of clinical profile of malignant pleural effusions in a tertiary care centre

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***Abstract*---**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. Materials and Methods: A total of 178 consecutive cases ≥ 18 years having pleural effusion with proven underlying malignancy were included in the 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. 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. 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%). 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. 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.

***Keywords*---**pleural effusion, cirrhosis, nephrotic syndrome, malignant effusions.

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. Lung cancer is the most common metastatic tumor to the pleura in men, while breast cancer is the most common tumor in women. 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%. 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]
The etiological classification of pleural effusions in different series depends on the geographical area, the age of the patient and the progress of the diagnostic and therapeutic methods of the cause. There is still a gap in knowledge of etiological diagnosis and therapeutic forms of pleural effusion due to limited research in different geographical locations.[5] The purpose of this study was to identify the relative proportion of different malignancies and clinical profile of patients with malignant PE.

Materials and Methods

A total of 178 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

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 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 the procedure 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%). 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.

Organ Involved	N	%
Lung	78	43.8%
Breast	28	15.7%

Ovary	26	14.6%
Cervix	16	9.0%
Lymphoma	14	7.9%
Colon	14	7.9%
Rectum	2	1.1%
Total	178	100%

Table 1: Distribution of patients according to Organ Involvement

Histopathology	N	%
Adenocarcinoma	50	28.1%
Squamous Cell Carcinoma	40	22.5%
Invasive Carcinoma	28	15.7%
Papillary Serous Cystadenocarcinoma	20	11.2%
Small Cell Carcinoma	20	11.2%
Hodgkin's Lymphoma	10	5.6%
Mucinous Cystadenocarcinoma	6	3.4%
Non-Hodgkin's Lymphoma	2	2.2%

Table 2: Distribution of patients according to Histopathological Diagnosis

Discussion

Most common organ involved is lungs (78 cases out of 178) 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, where out of 178 malignant cases, lung carcinomas were 56 cases (32.58%), breast carcinoma 28 cases (21.34%), followed by haematological and gynaecological carcinoma (7.8% each) and gastrointestinal tumours (5.6%).[6]

Considering histopathology of underlying malignancy, amongst all MPE cases adenocarcinoma was most common accounting for 50 (28.1%), followed by squamous cell carcinoma were 40 cases (22.5%), invasive carcinoma of breast were 28 cases (15.7%), papillary serous cystadenocarcinoma were 20 cases (11.2%), small cell carcinoma were 20(11.2%), Hodgkins lymphoma were 10 cases(5.6%), mucinous cystadenoma were 6 (3.4%) cases and non Hodgkins lymphoma was seen in 4 cases (2.2%).[7]

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%).[8] Similar finding were shown in studies done by with Chernow B et al. and CantóAet al, which demonstrated adenocarcinoma as the commonest histopathological type causing MPE in lung carcinoma.[9]

We also observed that massive effusion was seen in 53.9% cases, similar to that observed by Jobin et al. which showed malignant pleural effusion contributing to

massive effusion in 51.6%cases and in study done by Maher et al. it was55.4% cases. In present study, pleural fluid appearance was more commonly found to be hemorrhagic (50.56%) than straw colored pleural effusion (49.43%). This was similar to the study done by Zaysoe et al. which showed hemorrhagic effusion in 47.9% malignant cases and straw colored in 52.1% cases.[10]

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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