Experience from a specialist pleural clinic

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Introduction

Pleural disorders are common reason for referral to respiratory clinics. There are a number of conditions that can cause pleural disorders (1). Over 3000 patients per million develop pleural effusion each year (2). Similarly, around 100 new patients for every million of the population are diagnosed with a malignant pleural effusion (MPE) each year (1). Patients with pleural diseases can present to a number of specialties such as respiratory medicine, acute medicine, oncology, cardiology, rheumatology, nephrology, gastroenterology and thoracic surgery. The specialist pleural clinics allow for more streamline investigations and management of patients with pleural disorders. Through the designated specialist pleural clinics a systematic investigational approach can be applied based on the initial use of imaging such as a chest radiograph, thoracic ultrasound and computed tomography (3, 4, 5). In addition, specialised pleural clinics allow for more invasive investigations such as pleural fluid sampling. Another advantage of a specialist pleural clinic is in relation to the close work of a multidisciplinary team including respiratory specialists, radiologists, histopathologists, oncologists and palliative care specialists (3, 4). This allows for a multidisciplinary approach of managing patients with pleural disorders.

Malignant pleural effusion is probably the most common reason for referral to respiratory clinics (1). It is recognised that a number of cancers can metastasize to the pleura with breast and lung cancer being the most common (2). In addition, malignant mesothelioma a primary cancer of the pleura usually due to previous asbestos exposure, may present with pleural thickening or pleural effusion. There are a number of non-malignant causes of pleural effusion including infection, inflammatory conditions, renal disorders, liver disorders and cardiac disorders (1). Similarly, there are other conditions such as pneumothorax, pleural thickening including asbestos related pleural disease, which form a proportion of patients with pleural disorders. In this report, we describe our experience from a specialist pleural clinic in a large tertiary teaching hospital covering both rural and inner city population.

Methods:

A retrospective review of patients attending a specialist pleural clinic in a large tertiary teaching hospital covering both rural and inner city population. A database of anonymised patients who were referred to a specialist pleural clinic were analysed with regards to the underlying aetiology of pleural disorders. The findings were then divided according to their aetiology and underlying diagnosis.

Findings/results:

Overall, there were 1138 (795 male) cases reviewed. Their age distribution is described in Figure 1. Pleural effusion was the most common presentation (Table 1). Malignancy was the most common aetiology of pleural effusion and was found in 362 cases. Malignant mesothelioma was the most common reason of malignant pleural effusion, followed by breast cancer (Figure 2). The other aetiology of pleural effusion included infection found in 145 case, inflammatory found in 102 cases and cardiac causes found in 72 of cases (Table 1). The other less common causes of pleural effusion reported included 48 cases of asbestos pleural disease, 10 cases of pleural effusion due to liver disease and 8 cases of pleural effusion due to renal disease. Pneumothorax was the second most common cause found in 326 cases. Amongst the rare cases reported there were 5 cases of chylothorax, 4 cases of pleural effusion secondary to pulmonary embolism, 4 cases of pleural effusion due to Meigs's syndrome, 1 case of raised hemi-diaphragm, 1 case of pleural effusion due to sarcoid, 1 case of pleural disorder due to medication Dasatinib and 3 cases of pneumomediastinum.

Discussion

This study reported on the findings from a specialist pleural clinic in a large tertiary teaching hospital covering both rural and the inner city population. The most common causes for referral to the specialist pleural clinic included malignant pleural effusion as well as non-malignant pleural disorders such as pneumothorax, pleural infection, benign pleural thickening including asbestos related pleural disorders and pleural effusion due to cardiac disorders. Other less common causes included pleural effusion due to liver or renal diseases, pulmonary embolism, trauma or chylothorax. Our findings provide information on the spectrum of disorders managed through a specialist pleural clinic. There were two peaks with regards to the age of presentation. First smaller peak around the ages of 20 to 30 years, which may represent a higher prevalence of primary spontaneous pneumothorax in this age group. The second peak was around the ages of 70 to 90 years mainly reflecting a higher prevalence of pleural effusion in this age group. The confirmation of aetiology of pleural disorders was achieved using a systematic approach to investigations. The initial assessment included detailed clinical history including occupational exposure such as asbestos, careful medication history followed by clinical examination. The patients had a chest radiograph as the initial imaging assessment. Depending on the underlying pathology further imaging modalities were undertaken include a computed tomography (CT) thorax and in cases of suspected malignancy a Positron Emission Tomography (PET) CT scan. The patients also underwent thoracic ultrasound examination. One of the advantages of pleural clinics is access to a thoracic ultrasound and an experienced thoracic ultrasound operator. Thoracic ultrasound frequently complements or can be used in conjunction with other modalities such as CT, PET CT or magnetic resonance Imaging (6). Thoracic ultrasound allows for a real time assessment of pleural effusion, pleural thickening as well as surrounding structures including the diaphragm, axillary and cervical lymph nodes, the heart as well as the liver and the kidneys (7).

Malignant pleural effusion was one of the most common findings. Malignant pleural effusion affects more than 175,000 people each year in the USA and more than 40,000 in the United Kingdom (8, 9). The most common causes of malignant pleural effusion are due to cancers of the lung, breast, ovaries or due to lymphoma (10). The presence of malignant pleural effusion usually indicates an advanced cancer (11). In our series 362 patients had malignant pleural effusion with malignant mesothelioma being the most common malignancy reported. Malignant mesothelioma is a cancer originating from the mesothelial surfaces of the pleura and is related to previous asbestos exposure (12). Pneumothorax was the second most common diagnosis. Pneumothorax can be divided as spontaneous such as trauma or iatrogenic and non-spontaneous subtype, which is subdivided as primary and secondary when there is an underlying lung disease such chronic obstructive pulmonary disease, diffuse parenchymal lung diseases or cystic fibrosis (13). In a large study an annual rate of pneumothorax was reported at 22.7 per 100,000 with male to female ratio of 3.3 to (14). Our data showed that 326 cases had pneumothorax. Primary pneumothorax was the most common finding followed by secondary and traumatic pneumothorax.

Pleural infection was another common reason for referral to pleural clinic. The incidence of pleural infection has been reported as 11.2 cases per 100,000 population per year (1, 15). The management of pleural infection includes careful antimicrobial therapy, drainage of the fluid, nutrition and thromboembolic event prevention with some patients requiring surgery (1). The patients seen in the pleural clinic were assessed in our specialist pleural clinic following the acute admission and initial treatment. Patients with pleural infection were regularly reviewed in our pleural clinic. During each clinic visit the patients would undergo a careful clinical assessment including monitoring response to antibiotics and progression. In addition, the patients would undergo imaging examination such as a chest radiograph and thoracic ultrasound and if required CT scanning. The set up of the specialist pleural clinic allowed for a multidisciplinary approach and a close interaction between respiratory, microbiology, radiology and thoracic surgical teams. Many of the patients seen in pleural clinic had non-malignant pleural disorders of which the most common included inflammatory conditions such as rheumatoid arthritis, connective tissue disorders, cardiac disorders and renal and liver diseases. This was possible through a close collaboration between the rheumatology, renal and gastroenterology specialists. The management of these patients were undertaken according to the current evidence and the national guidelines (1, 16). Cardiac disease was the most common cause of non-malignant pleural effusion present in 72 cases. In addition, a small proportion of patients had underlying benign pleural thickening of which asbestos exposure was the most common cause.

In conclusion, a specialist pleural clinic provides a designated services to manage patient with pleural disorders. The referral pathways allow for a number of specialists to refer patients for further investigations and management. The patients undergo a systematic investigation protocol based on a careful history and examination followed by a chest radiograph and the use of a thoracic ultrasound. This is usually followed by computed tomography and PET CT scanning. In the setting of a specialist pleural clinic, the patients are able to undergo ultrasound guided pleural fluid sampling and drainage for diagnostic and therapeutic purposes. The close collaboration within the multidisciplinary team allows access to radiological testing, histopathological expertise, microbiological expertise and access to thoracic surgical and oncology teams. In addition, close collaboration with cardiology, gastroenterology, rheumatology and renal teams provide more standardises management of patients with non-malignant pleural disorders. The use of ambulatory pathways within the pleural clinic setting allows for an early discharge and close follow up of patients with pleural disorders. This is of particular importance in managing pneumothorax, pleural infection and malignant pleural effusion. Through the pleural clinic services the patients can also access more specialist procedures such as pleural fluid sampling or therapeutic drainage, insertion of indwelling pleural catheter or thoracoscopic procedures. Overall, through the specialist pleural clinic the patients receive more standardised, care based on the current guidelines and supported by a specialist team.

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Figure 1. Age distribution in years of patients attending pleural clinic

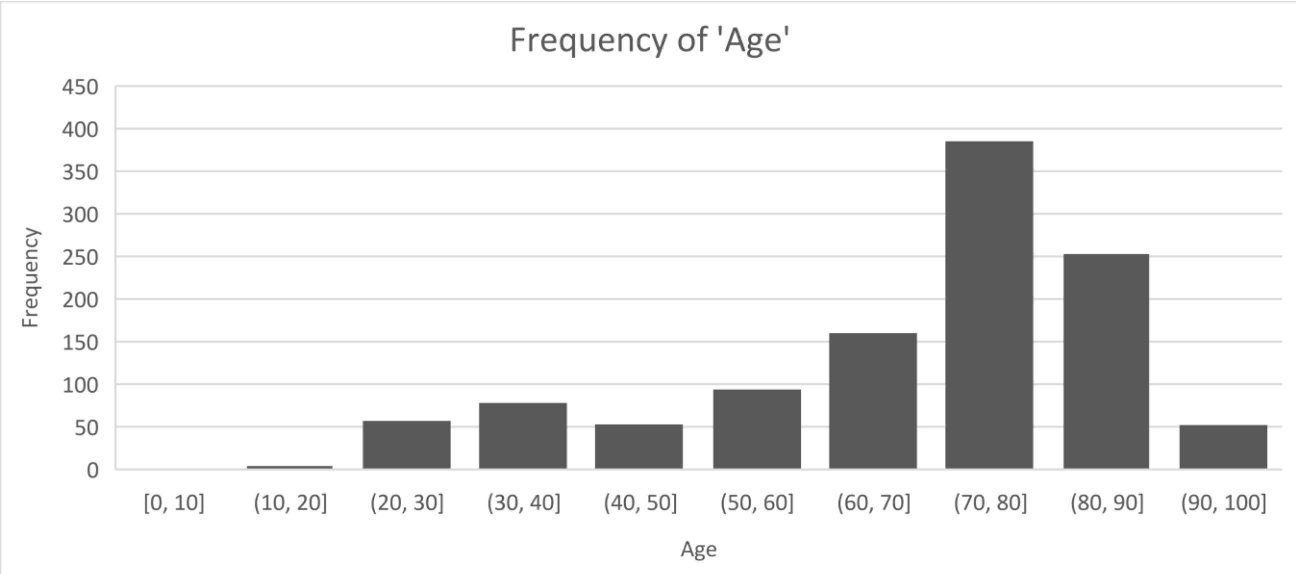

Figure 2. Prevalence of malignant pleural effusion

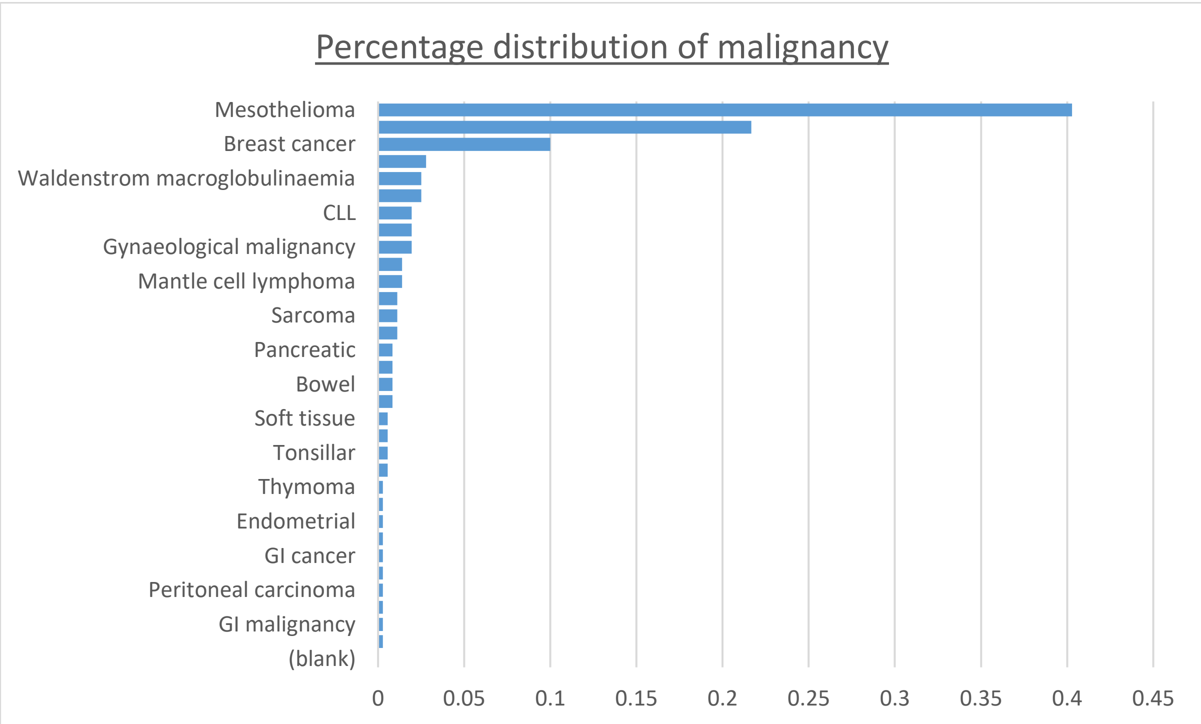

Table 1. Specialist Pleural Clinic distribution of aetiology of pleural disorders

Indication	Count of Indication	Percentage
Malignancy	362	31.81%
Pneumothorax	326	28.65%
Infection	145	12.74%
Inflammatory	102	8.96%
Cardiac causes	72	6.33%
Asbestos related	48	4.22%
Others	16	1.41%
Benign pleural thickening	15	1.32%
Trauma	11	0.97%
Unclear	10	0.88%
Liver cirrhosis	10	0.88%
Renal failure	8	0.70%
Chylothorax	8	0.70%
PE	5	0.44%
Total count	1138	