International Journal of Medical and Health Research
www.medicalsciencejournal.com
ISSN: 2454-9142
Received: 04-12-2021, Accepted: 20-12-2021, Published: 05-01-2022
Volume 8, Issue 1, 2022, Page No. 13-16

To evaluate the patients with active hemoptysis in a tertiary care hospital

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Abstract
Aim: To evaluate the patients with active hemoptysis in a tertiary care hospital.
Methods: This study was done the Department of Pulmonary medicine. 100 patients of active hemoptysis were included in this study. After a complete history and physical examination, investigations were sent. Routine blood investigations including Hb%, complete blood count, PT-INR, Bleeding time, clotting time were sent. CT thorax was done for all the patients. CT confirms the presence of bronchiectasis. Sputum test was done for all the patients. The sputum test included sputum microscopy by Ziehl-Neelsen staining, CB-NAAT, fungal staining, BACTEC culture, gram staining and culture sensitivity.
Results: Total 100 patients were included in the study. Out of that male were 65 and female 35. Average age of the patients was 47.98 years. 50(50%) patients had active pulmonary tuberculosis, 23 (23%) patients were suffering from bronchiectasis, 9 patients had malignancy, 4 patients were suffering from pneumonia, 4 patients had fungal ball, 2 patients had collagen vascular diseases,1 patient was found to be having a mitral stenosis related complication, 1 patient had pulmonary embolism, 2 patients presented with hemoptysis due to chest trauma, the etiology of hemoptysis for 4 patients could not be identified. According to the severity of active hemoptysis, as shown in table 2, 46 patients presented with mild hemoptysis, 29 patients presented with moderate hemoptysis, while 25 patients had come to the emergency with complaints of massive hemoptysis. Among the mild hemoptysis group, 19 patients had tuberculosis, 10 had bronchiectasis, 7 had malignancy, 7 had pneumonia, mitral stenosis 1, one patient had pulmonary embolism, 4 patients' etiology could not be identified. Among the patients presented with moderate hemoptysis 17 patient had tuberculosis, 4 had bronchiectasis, 2 had malignancy, fungal ball 4, 2 patients had collagen vascular diseases. Among the massive hemoptysis patients, 14 patients had tuberculosis, 9 had bronchiectasis, 2 patients presented with trauma chest.
Conclusion: Hemoptysis is a common symptom with a good prognosis in most cases. The most common cause of hemoptysis is active pulmonary tuberculosis. The second common cause is bronchiectasis. Most of the cases presented with massive hemoptysis are due to pulmonary tuberculosis.

Keywords: hemoptysis, pulmonary tuberculosis, bronchiectasis

Introduction

Coughing out of blood is very alarming and distressing to any patient and need urgent medical attention. Hemoptysis is a common cardinal symptom of pulmonary diseases in patients presenting in chest clinic as well as in emergency department [1]. Hemoptysis ranges from minimal with streaked sputum to massive life threatening to the patient. The source of hemoptysis may be tracheobronchial tree, pulmonary parenchyma and or pulmonary vascular tissues together depending upon the cause [2]. Hemoptysis has multiple etiologies. In previous years, pulmonary tuberculosis was the commonest cause but the scenario has changed over last many years because of increased detection of other diseases, occurrences of treatment related consequences and consumption of tobacco [3]. Course and prognosis of hemoptysis ranges from self-limitation and symptom alleviation, requiring conservative management to interventions like bronchial artery embolization and thoracic surgery depending upon the causes [4]. Detailed evaluation including imaging and bronchoscopic studies are essential to reach the diagnosis. Special treatment interventions and evaluation tools are not available everywhere in our country. Most of the time we have to depend upon the traditional investigation for diagnosis and conservative management approach for clinical cases. Because of various reasons most of the etiologies are not amenable to permanent cure leading to recurrences of hemoptysis. The recurrences of hemoptysis has resulted in mental trauma in our patients. Nearly in more than one third of the cases the cause could not be found even after special investigations that again gave mental, financial and temporal trauma to the patients [5].

Material and Methods

This study was done the Department of Pulmonary medicine, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the patient or relatives.

100 patients of active hemoptysis were included in this study. After a complete history and physical examination, investigations were sent. Routine blood investigations including Hb%, complete blood count, PT-INR, Bleeding time, clotting time were sent. Blood for connective tissue disorder like, ANA profile was also sent. In special situation, fungal stain and serum antibody was also sent. Urine microscopy was sent to rule out hematuria. Radiological investigations like X- ray and CT thorax was done. X-ray was done to diagnose any pulmonary abnormality or localization of the lesion. It is very helpful

regarding the management of active hemoptysis. The signs of tuberculosis in the chest x- ray, like nodules, military mottling, infiltration, consolidation, effusion, cavitary lesion, fibrosis was noted [6-9].

CT thorax was done for all the patients. CT confirms the presence of bronchiectasis. The location of the bronchiectasis was also noted. The radiological signs of bronchiectasis were observed. CT scan is also helpful for the diagnosis of any space occupying lesion. The lesion can be in the lung parenchyma or endobronchial. It also helps us differentiating a benign from malignant lesion. CT scan is also very important before doingfibro-optic bronchoscopy. Ct scan can help us localizing a lobe or a segment to take bronchial lavage or bronchial brushing or therapeutic balloon tamponade.

Sputum test was done for all the patients. The sputum test included sputum microscopy by Ziehl-Neelsen staining, CB-NAAT, fungal staining, BACTEC culture, gram staining and culture sensitivity. The patient with active hemoptysis, who gave blood mixed sputum, could not be sent for CB-NAAT test. We had to wait for the production of blood free sputum for doing the CB-NAAT. The sputum processing was done as per the guideline of the TB control programmed in India (NTEP) [10]. Acid fast bacilli isolated either microscopy, genetic testing or culture was labelled as anactive sputum positive pulmonary tuberculosis. Microorganisms isolated by gram staining were noted. The antibiotic sensitivity pattern was registered. Sputum samples were processed for fungal stain and culture. The fungal organism isolated by fungal staining was noted. Further, samples were processed for fungal culture for the confirmation and species identification. The sputum microscopy was also done to look for any malignant cell.

Results

Total 100 patients were included in the study. Out of that male were 65 and female 35. Average age of the patients was 47.98 years. About 70 patients came from rural area while 30 patients were from urban area. All the patients presented to the hospital with the complaints of active hemoptysis. After proper clinical history, routine blood investigation, radiological study and fibro-opticbronchoscopy the results were scientifically tabulated. The result of this study is shown in table 1. The results obtained from this study was, 50(50%) patients had active pulmonary tuberculosis, 23 (23%) patients were suffering from bronchiectasis, 9 patients had malignancy, 4 patients were suffering from pneumonia, 4 patients had fungal ball, 2 patients had collagen vascular diseases,1 patient was found to be having a mitral stenosis related complication, 1 patient had pulmonary embolism, 2 patients presented with hemoptysis due to chest trauma, the etiology of hemoptysis for 4 patients could not be identified. According to the severity of active hemoptysis, as shown in table 2, 46 patients presented with mild hemoptysis, 29 patients presented with moderate hemoptysis, while 25 patients had come to the emergency with complaints of massive hemoptysis. Among the mild hemoptysis group, 19 patients had tuberculosis, 10 had bronchiectasis, 7 had malignancy, 7 had pneumonia, mitral stenosis 1, one patient had pulmonary embolism, 4 patients' etiology could not be identified. Among the patients presented with moderate hemoptysis 17 patient had tuberculosis, 4 had bronchiectasis, 2 had malignancy, fungal ball 4, 2 patients had collagen vascular diseases. Among the massive hemoptysis patients, 14 patients had tuberculosis, 9 had bronchiectasis, 2 patients presented with trauma chest.

Table 1: Age and gender distribution

Gender	Number of patients	Percentage
Male	65	65
Female	35	35
Age in mean	47.98	

Table 1: Clinical cases with complaints of active hemoptysis

Diseases	Number of patients	Percentage
Tuberculosis	50	50
Bronchiectasis	23	23
Malignancy	9	9
Pneumonia	4	4
Fungal ball	4	4
Vasculitis	2	2
Mitral stenosis	1	1
Pulmonary embolism	1	1
Trauma	2	2
Non specific	4	4

Table 2: Severity of active hemoptysis in different clinical cases

Diseases	Mild=46	Moderate=29	Massive=25
Tuberculosis	19	17	14
Bronchiectasis	10	4	9
Malignancy	7	2	-
Pneumonia	4	-	-
Fungal ball	-	4	-
Vasculitis	-	2	-
Mitral stenosis	1	-	-
Pulmonary embolism	1	-	-
Trauma	-	-	2
Non-specific	4	-	-

Discussion

In this cross-sectional observational institution-based study comprising 100 patients, we have found that 50% of the patient is suffering from active tuberculosis. Bhalla *et al*, in his study in India found that 65% of the patient is suffering from TB [11]. His study population was 64 patients. Our result is corroborating with his study. Fartoukh *et al*, in his study in France, found that 25% of the patients of hemoptysis is suffering from TB. His sample size was 1087 patients. Our result is not corroborating with his study. This difference may be due to a geographical variation or the magnitude of TB in that particular place. The difference of result may also be due to a huge number of sample sizes [12]. Kirl *et al*, in his study in Turkey, found that 21% of the patient is suffering from tuberculosis. His sample size was 203 patients. Our result is not corroborating with his study [13]. Chan *et al*, in his study in Hongkong, found that 42% of the patients suffering from TB. His study population was 251 patients. Our result varies from his study. This may be due to differentin prevalence of TB in that particular place [14]. Shigemura *et al*, in his study in China, found that 55% of the patients suffering from TB. His study population was 62 patients. Our result is corroborating with his study [15]. Ong and Eng *et al*, in their study in Singapore, found that 10% of the patients suffering from TB. His study population was 29 patients. Our result varies from his study. This may be due to small sample size [16]. Valipour *et al*, in his study

in Austria, found that 23% of the active hemoptysis patients were suffering from TB. His study population was 57 patients. Our result is not corroborating with his study.

Our result varies from his study [17]. Revel *et al*, in his study in France, found that 19% of theactive hemoptysis patients were suffering from TB. His study population was 80 patients. In our study on 100 patients, we have found that 50% of the patients having hemoptysis are suffering from active tuberculosis. This variation of result may also be described by a difference in demography and a spectrum of disease prevalence [18]. Lee *et al*, in his study in Hongkong, found that 17% of the patients of active hemoptysis were suffering from TB. His study population was 54 patients [19]. Hsiao *et al*, in his study in USA, found that 7% of the patients of active hemoptysis were suffering from TB. His study population was 28 patients [20]. As discussed, it is evident that, tuberculosis as a cause for active hemoptysis varies over different studies conducted in different region and time. But in most of the study, tuberculosis remains an important etiology for hemoptysis. The evaluation of hemoptysis is meaningless without investigating for TB. Although, plenty of cause is there for hemoptysis, tuberculosis as an etiology should be excluded.

In this cross-sectional institution-based observational study on 100 patients, we have found that 23% of the patients having hemoptysis is having underlying bronchiectasis. Bhalla *et al*, in his study in India found that 9% of the patients suffering from bronchiectasis.[11] His study population was 64 patients. Our result is not corroborating with his study. This difference may be attributed to sample size, place of study, study

population.Kirl *et al*, in his study in Turkey, found that 15% of the patients suffering from bronchiectasis.[13] His study population was 203 patients. Fartoukh *et al*, in his study in France, found that 20% of the patients suffering from bronchiectasis.[12] His study population was 1087 patients. Chan *et al*, in his study in Hongkong, found that 32% of the patients suffering from bronchiectasis.[14] Shigemura *et al*, in his study in China, found that 23% of the patients suffering from bronchiectasis.[15] Valipour *et al*, in his study Austria, found that 8.5% of the patients suffering from bronchiectasis.[17] Ong and Eng *et al*, in their study in Singapore, found that 66% of the patients suffering from bronchiectasis.[16] Revel *et al*, in his study in France, found that 31% of the patients suffering from bronchiectasis.[18] Hsiao *et al*, in his study in USA, found that 57% of the patients suffering from bronchiectasis.[20] Lee *et al*, in his study in Hongkong, found that 57% of the patients suffering from bronchiectasis.[19] So, it is clear that, the prevalence of hemoptysis due to bronchiectasis varies from 8.5% to 66%, over different part and different study conducted over the period of time. The value we got from our study is 23%. This difference may be due to different of diseases prevalence. As discussed, bronchiectasis remains an important etiological factor in causing active hemoptysis. The evaluation of hemoptysis patient should comprise a thorough workout for bronchiectasis. Early detection of bronchiectasis will lead to a prompt action to control bleeding.

The occurrence of bronchogenic carcinoma presenting as hemoptysis varies in different studies. In few studies it's uncommon. But in other studies, the magnitude is very high. The occurrence is as high as 35%.[17] So, ideally, we should exclude lung carcinoma in active hemoptysis patients. Specially, elderly male with history of smoking, presenting with weight loss, cough, chest pain, superior vena-cava obstruction syndrome, with streaky hemoptysis, a possibility of malignancy should be excluded. Similarly, fungal infection causing hemoptysis varies over different geographical areas and in different studies. It is a common cause of hemoptysis in few studies [14]. So, a fungal disease should be excluded in an active hemoptysis patient. Pneumonia as a cause of hemoptysis was found as a common disease in few studies [11]. In our study also pneumonia is a significant disease to cause hemoptysis. Pneumonia should be excluded in evaluating a patient of hemoptysis on a routine basis. Other common diseases like, trauma chest, pulmonary embolism, vasculitis, bleeding diathesis, cardiac causes should be looked for. In a few instances, the cause cannot be determined even after doing exhaustive diagnostic procedures. This indicates a further study on hemoptysis.

Conclusion

Hemoptysis is a common symptom with a good prognosis in most cases. The most common cause of hemoptysis is active pulmonary tuberculosis. The second common cause is bronchiectasis. Most of the cases presented with massive hemoptysis are due to pulmonary tuberculosis.

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