



Hemoptysis : Diagnosis And Management In A Tertiary Referral Centre

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ABSTRACT

Objective: To evaluate the demographic profile, etiology, severity, diagnosis and management of hemoptysis.

Material and methods: Eighty two consecutive patients of hemoptysis who were admitted to Department of Pulmonary Medicine during 1st October, 2008 and 31st March 2009 were included in the study. Hemoptysis was classified as mild (streak of blood or < 150 ml/24 hrs), moderate (150 – 500 ml/24 hrs) and massive (> 500 ml/24 hrs) according to the amount of bleeding. Patients were investigated and managed accordingly.

Results: Of 82 patients with hemoptysis, 62 were males and 20 were females. Cough was the most common associated symptom present in 68 (83 %) patients. Pulmonary tuberculosis was the most common etiology present in 40 % of cases. Combined modality of CT and bronchoscopy had better diagnostic yield of 83.3 % compared to CT (57.4 %) and bronchoscopy (42.9 %) alone. 36 % patients presented with massive hemoptysis all of whom were managed with bronchial artery embolization.

Conclusion: Hemoptysis should not be considered synonymous of active pulmonary tuberculosis. A good diagnostic workup including CT and bronchoscopy is required to find the etiology. Bronchial artery embolization should be the earliest treatment modality in young patients with massive hemoptysis.

KEYWORDS

Hemoptysis, tuberculosis, bronchial artery embolization

INTRODUCTION

Hemoptysis, defined as expectoration of blood or blood tinged sputum originating from the lungs or tracheobronchial tree, is a serious and potentially lethal condition because of its unpredictable severity and course. It is frightening and life threatening symptom of various pulmonary and extrapulmonary diseases. When massive and untreated, has a mortality rate of > 50%¹. The vast majority of hemoptysis originates from the bronchial arteries (90%) as compared with the pulmonary arteries (5%)². In the management of patients with hemoptysis, chest roentgenography and Computed Tomography scanning may point to the likely source of hemorrhage. However, bronchoscopy is the more definitive diagnostic test to identify the bleeding site within the tracheobronchial tree. Management of hemoptysis aims to stop the bleeding, replenish the blood loss, and treat the underlying etiology. Patients with massive hemoptysis should be treated with endobronchial tamponade, single- or double- lumen bronchial intubation, bronchial artery embolization or surgery.

The purpose of this study was to evaluate the demographic profile, etiology, severity, diagnostic evaluation and management of patients of hemoptysis in a tertiary care centre in north India.

MATERIALS AND METHODS

We retrospectively reviewed the records of admitted patients with hemoptysis in Department of Pulmonary Medicine at the Dayanand Medical College & Hospital, Ludhiana, a tertiary level care centre in North India. 98 files of the patients who were admitted during 1st October, 2008 and 31st March 2009 were screened. 16 were excluded due to lack of proper information. Finally, 82 records were evaluated for the following information: demographic profile (age, sex), associated symptoms,

severity of hemoptysis, diagnostic modalities, diagnosis and management. We divided the patients into three groups according to the amount of bleeding: mild (streak of blood or < 150 ml/24 hrs), moderate (150 – 500 ml/24 hrs) and massive (> 500 ml/24 hrs).

RESULTS

Demographic profile

Of the 82 patients, there were 62 (76 %) males and 20 (24 %) females. The age of patients was in the range of 18 – 82 years.

Associated symptoms

The average duration of symptoms ranged from 6 hours prior to admission to about 1 year. 68 out of 82 (83 %) patients had associated cough. 43 (52.4 %) were complaining of shortness of breath mostly in cases of extensive pulmonary tuberculosis and bronchitis. Fever was associated in 39 (47.5 %) patients and 32 (39 %) had chest pain as associated symptom. Of the 82 patients, 68 (83 %) had received anti tubercular therapy on empirical or definitive basis for the average of 10 days to 9 months.

Severity of hemoptysis

38 (46 %) patients had mild hemoptysis including some with only streak of blood while 30 (36%) had massive bleeding with 6 requiring blood transfusion and immediate bronchial artery embolization. 14 (18 %) patients had hemoptysis of moderate grade. Lung cancer, pneumonia and allergic bronchopulmonary aspergillosis commonly presented with mild hemoptysis while moderate to massive bleeding was present in extensive pulmonary tuberculosis and bronchiectasis patients.

Diagnostic evaluation (Table 1)

Chest roentgenogram was the first and the foremost investigation and it was done in all the 82 patients but it was diagnostic in 43 (52 %) patients only. Clear cut diagnosis only on chest roentgenogram was made in patients of pulmonary tuberculosis, aspergilloma and bilateral bronchiectasis. Computed Tomography was done in 54 out of 82 (66 %) patients with a diagnostic yield of 57 %. The patients in whom CT was diagnostic were mostly of bronchogenic carcinoma, bronchiectasis and pulmonary tuberculosis in that order. Bronchoscopy was done where the diagnosis was still uncertain after CT and in some cases to locate the site of bleeding from bronchial artery embolization. It was done in 28 out of 82 patients (34 %) and Bronchoalveolar Lavage with biopsy (endobroncheal or transbronchial) was done. Bronchoscopy was diagnostic in only 12 out of 28 (43 %) patients mostly in cases of bronchogenic carcinoma and pulmonary tuberculosis. The positive diagnostic yield of bronchoscopy was greater when chest radiograph had some evidence of abnormality (10/22, 45 %) than in cases with normal radiology (2/6, 33 %). When diagnostic yield of CT and bronchoscopy combined was compared with each procedure alone, it was found that the combined modality was more useful in reaching a final diagnosis. Combined modality was performed in 24 out of 82 (29 %) patients and diagnostic in 20 (83 %) patients.

Etiology

The causes of hemoptysis are listed in (Table 2) in the order of frequency. Pulmonary tuberculosis, lung cancer and aspergilloma were the three most common causes in our set up. Pulmonary tuberculosis was the most common cause accounting for 40.2 % of cases out of which 67 % were sputum positive for AFB (acid fast bacilli) and rest 33 % were adequately treated for pulmonary tuberculosis. 4 out of 22 patients of active pulmonary tuberculosis were proven multi drug resistant (MDR). Of the patients of lung cancer, 8 out of 13 (61.5 %) had primary bronchogenic carcinoma and remaining (38.5 %) had metastatic deposits to the lung. Squamous cell carcinoma was most common followed by adenocarcinoma and small cell carcinoma. 8 out of 82 (9.7 %) patients had pneumonia (5 bacterial, 2 fungal and 1 nocardial). 7 out of 82 (8.5 %) had aspergilloma demonstrated on radiology causing hemoptysis. Other rare causes were Idiopathic pulmonary hemosiderosis, Arterio-venous malformation and bronchial adenoma. In 3 patients (3.5 %), no cause could be found on investigations.

Management

All patients were managed initially with conservative treatment and given hemostatics, anxiolytics and absolute bed rest with treatment of underlying cause. One patient of arterio-venous malformation was referred for surgery. Bronchial Artery Embolization was done in 30 (patients), all those who presented with massive hemoptysis (> 500 ml of blood loss during 24 hours).The etiology included adequately treated pulmonary tuberculosis in 14 patients, fresh pulmonary tuberculosis in 7 patients, bronchiectasis 4, aspergilloma 3 and 2 patients with unknown cause. The most common finding on bronchial arteriography was hypervascularity in 24 patients followed by bronchial artery hypertrophy in nine patients. In 23 patients, Poly vinyl alcohol Cook's particles (size – 300-500 microns) were used and in remaining 7, appropriate size coils were used.

DISCUSSION

Our study aimed at characterizing the demographic profile and clinical spectrum of patients admitted with hemoptysis in a six month period. Various retrospective studies have been published by Indian as well as foreign authors to find out the etiology, prognostic factors, management and outcome of hemoptysis.

In this study, there was male predominance. 76 % of the patients were above 40 years of age and 58 % were current or ex- smokers. As far as the duration of symptoms is concerned, patients with massive hemoptysis presented earlier in the course than in patients having streak or mild hemoptysis.

Patients with pulmonary tuberculosis had associated constitutional symptoms at presentation like cough or fever.

Most patients underwent a thorough investigation including chest roentgenogram, CT chest and bronchoscopy to find the etiology. Out of all above mentioned investigations, CT scan had best diagnostic yield of 57 % on its own and it increased to 83 % when both CT and bronchoscopy were done as a combined modality. Set et al³ demonstrated similar findings in their retrospective analysis. Bronchoscopy alone was diagnostic in 43 % of patients and was primarily done to locate the site of hemoptysis in patients in whom bronchial artery embolization or lobectomy was planned.

Pulmonary tuberculosis and its sequele like aspergillomas are the leading causes of hemoptysis in the studied population followed by bronchogenic carcinoma. In two similar studies by Hirschberg et al⁴ and Noriaki et al⁵, bronchiectasis was the most common cause followed by lung cancer. This type of difference arises due to bias secondary to group of patients selected and the prevalence of disease in that area. The most frequent etiologies of hemoptysis in the western world are chronic inflammatory lung diseases and bronchogenic carcinoma⁶ while tuberculosis remains the leading cause in third world countries⁷⁻¹⁰.

Patients with mild hemoptysis were managed with conservative treatment (correction of tissue perfusion, hypoxia). Bronchial artery embolization was done in patients of recurrent moderate and massive hemoptysis with success rate of 74 %. In various studies the success rate of bronchial artery embolization varies from 85 – 98 %¹¹⁻¹³. Only 2 patients underwent surgery, one with arterio-venous malformation and the other with bronchial adenoma. The number of indications for surgery has decreased over last 2 decades due to advent of procedures with lesser morbidity like BAE and endobronchial tamponade.

Hemoptysis is not synonymous with active pulmonary tuberculosis as is commonly thought. Hemoptysis may occur as the initial manifestation of active tuberculosis, during the course of treatment or even after the disease has been adequately treated. For pathologies not detectable on chest radiograph, CT scan and bronchoscopy as a combined modality is now becoming the investigation of choice due to easy availability and less invasiveness. For effective control of massive hemoptysis, bronchial artery embolization has now become the first line of treatment.

TABLES

TABLE 1

Table showing diagnostic procedure used and the diagnostic yield

DIAGNOSTIC PROCEDURE	PERFORMED (%)	DIAGNOSIS (%)
CHEST ROENTGENOGRAPHY	82 / 82 (100)	43 / 82 (52.4)
COMPUTED TOMOGRAPHY (CT)	54 / 82 (65.9)	31 / 54 (57.4)
BRONCHOSCOPY	28 / 82 (34.1)	12 / 28 (42.9)
CT + BRONCHOSCOPY	24 / 82 (29.2)	20 / 24 (83.3)

TABLE 2

Table showing the etiology of hemoptysis with frequency

DIAGNOSIS	TOTAL NUMBER (%)
PULMONARY TUBERCULOSIS	33 (40.2)
BRONCHOGENIC CARCINOMA	13 (15.8)
PNEUMONIA	8 (9.8)
MYCETOMA	7 (8.5)
CHRONIC BRONCHITIS	6 (7.3)

BRONCHIECTASIS	5 (6.1)
ABPA	4 (4.9)
ARTERIO-VEINUS MALFORMATION	1 (1.2)
IDIOPATHIC PULMONARY HEMOSIDEROSIS	1 (1.2)
BRONCHIAL ADENOMA	1 (1.2)
UNKNOWN	3 (3.8)

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