



Original article

Etiology of Hemoptysis in India Revisited

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ABSTRACT

Aims and Objectives: To study the changing trend in the causes of hemoptysis in India. **Materials and Methods:** Total of 246 patients complaining of hemoptysis were taken up for this prospective study. The study was approved by the local ethics committee and informed consent from all patients were obtained prior to commencement of the study. All the patients were fully investigated to find out the etiology of hemoptysis. Besides routine investigations, bronchoscopy was also done in patients, where non bronchoscopic methods failed to reveal the cause. Other investigations like CT scan, FNAC/Biopsy was done in selective patients. **Results:** The most common etiologies of hemoptysis in our study were tuberculosis[27.9%] followed by malignancy[18.6%] and bronchiectasis[16.5%]. Out of 246 patients, 145 patients had mild hemoptysis [58.9%], 57 had moderate [23.1%], 44 had severe hemoptysis [17.8%]. 32.2% patients of mild hemoptysis were diagnosed as bronchogenic carcinoma, 97% of the patients with idiopathic hemoptysis were having mild hemoptysis. Of the 57 patients with moderate hemoptysis, 25% were diagnosed as having bronchogenic carcinoma, 41.6% were having tuberculosis as the etiology for hemoptysis. Tuberculosis (46.4%) and bronchiectasis (42.8%) were the most common etiologies in patients with severe hemoptysis. **Conclusion:** In India, the most common cause of hemoptysis still remains tuberculosis, although the incidence has significantly decreased.

KEYWORDS: Hemoptysis, Tuberculosis, bronchiectasis

INTRODUCTION

Hemoptysis is defined as expectoration of blood originating from lungs or bronchotracheal tree[1]. The material that is produced varies from blood tinged sputum to virtually pure blood. Hemoptysis is a frightening symptom for the patients and can be a manifestation of serious underlying disease. The vast majority of hemoptysis events originate from the bronchial arteries (90%) as compared with the pulmonary

arteries(5%)[2]. The etiology for hemoptysis varies among different series according to time of publication, the geographic location, and the diagnostic tests employed. In India, first thing which comes to mind in a patient with hemoptysis is tuberculosis and patients are often treated for pulmonary kochs without proper evaluation.

The main aim of present study was to revisit the various etiologies of hemoptysis using bronchoscopic and non bronchoscopic methods, and to define the characteristics associated with different etiologies.

MATERIALS AND METHODS

The present study was conducted on patients, attending the Outpatient Department (OPD) and those who were admitted in the wards (IPD) of Department of Tuberculosis and Chest Diseases, Jawaharlal Nehru Medical College Hospital, Aligarh Muslim University, Aligarh, India for 3 year duration. Total of 246 patients complaining of hemoptysis were taken up for this prospective study. The study was approved by the local ethics committee and informed consent from all patients were obtained prior to commencement of the study.

Detailed clinical history was recorded and the patients were thoroughly examined with a detailed reference to the general physical examination pertaining to the respiratory diseases. The complaints which were evaluated in detail included hemoptysis (amount, time of onset in relation to duration of other symptoms), cough, sputum production, chest pain, dyspnoea, fever, weight loss, anorexia, hoarseness of voice, dysphagia, and symptoms suggestive of malignancy. History of cigarette smoking, cardiopulmonary disease, hematuria and symptoms of nasal, oropharyngeal, laryngeal disease, or gastrointestinal disease were noted, if any. The presenting quantity of hemoptysis was estimated as best as possible from the patient's history, and was classified arbitrarily according to the severity into mild(<30ml/day), moderate(30-200ml/day), or severe(>200ml/day) depending upon the amount of bleeding.

Baseline routine laboratory investigations including hemogram, ESR, KFT, ABG was done in all patients. Patients were asked to collect sputum in sterile wide mouthed vials after rinsing the mouth with plain water in the morning to bring out first cough sample, which was then sent to the laboratory on at least 3 consecutive days for (a) Cytopathological examination to look for malignant cells (b) Sputum for acid fast bacilli by Ziehl Nelson technique and (c) Sputum smear and culture for bacteria, and fungus. Chest Roentgenography (Posteroanterior view and Right or left lateral view) was done in all patients.

Fibreoptic bronchoscopy(FOB) was done in 157 patients. FOB was done using Olympus (BF Te2e) model in an endoscopy room or bedside. Medical records were analyzed for the quantity and duration of hemoptysis, prior diagnostic procedures, timing of FOB (in relation to hemoptysis), endoscopic findings and results of any accessory procedures. Although attempt was made to perform the procedure as soon as possible, FOB was performed up to 10 days following the initial event because of technical problems. For the purpose of this study, a definitive (or endoscopic) diagnosis for hemoptysis was made if FOB revealed a specific bleeding lesion, endobronchial mass, or positive and specific microbiology, cytology or histology.

An endoscopic diagnosis of bronchitis was made on account of presence of generalized inflammation of the airways (redness and swelling of mucosa), indistinct cartilage rings, presence of small diverticula in the bronchial mucosa and dilatation of the mucous gland ducts in the bronchial wall. A non-bleeding abnormality was not considered a definitive lesion but was consistently recorded. The influence of FOB was determined by noting whether or not changes in the clinical diagnosis and management of the hemoptysis occurred, based on results of each FOB. A final diagnosis for the hemoptysis was based on the definitive diagnosis and/or review of subsequent historical, radiological, surgical, or autopsy information, if sufficient to establish a probable cause of bleeding. CT scan/ CT guided FNAC or biopsy, percutaneous FNAC or biopsy was done in selected patients.

RESULTS

Out of the total of 246 patients with hemoptysis, chest roentgenogram was interpreted as normal or with non-localizing abnormalities in 48. Four of them did not give consent for bronchoscopy. Of the remaining 198 patients with localizing findings on the chest roentgenogram, diagnosis was made in 141 by non-bronchoscopic measures. Sixty of these patients were having persistent hemoptysis and were planned for therapeutic bronchoscopy. Fifty seven patients with abnormal roentgenogram not diagnosed by non-bronchoscopic techniques were planned up for bronchoscopy. Hence, a total 157 patients underwent fibreoptic bronchoscopy. In none of the patients was there an abnormality of clotting, or a bleeding source found on otolaryngologic examination. Out of 246 patients with hemoptysis, 157 patients underwent bronchoscopy.

The age of the patients ranged between 23 to 85 years. The mean age of the patients was 58.76 years. Out of 246 patients, 178 were males [72.3%], 68 [27.7%] females. 150 were smokers[60.9%], 96 were nonsmokers. Among smokers, 90% were males. The most common etiologies of hemoptysis in our study[Table 1] were tuberculosis[27.9%] followed by malignancy[18.6%] and bronchiectasis[16.5%]. Other less common causes were bronchitis, pneumonia, lung abscess and congestive heart failure [table 1].

145 patients had mild hemoptysis[58.9%], 57 had moderate [23.1%], 44 had severe hemoptysis [17.8%]. 32.2% patients of mild hemoptysis were diagnosed as bronchogenic carcinoma, 97% of the patients with idiopathic hemoptysis were having mild hemoptysis. Of the 57 patients with moderate hemoptysis, 25% were diagnosed as having bronchogenic carcinoma, 41.6% were having tuberculosis as the etiology for hemoptysis. Tuberculosis (46.4%) and bronchiectasis (42.8%) were the most common etiologies in patients with severe hemoptysis. FOB was done in 157 patients and bleeding site was localized in 76 patients.

Table 1: Final diagnosis in patients who presented with hemoptysis.

Causes	Number(%)	Patients in which FOB was done
Bronchitis	19(7.8%)	15(78.9%)
Malignancy	45(18.6%)	39(86.7%)
Tuberculosis (active)	45(18.6%)	24(53.3%)
Tuberculosis (inactive)	22(9%)	9(40.9%)
Bronchiectasis	40(16.5%)	25(62.5%)
Pneumonia	12(4.9%)	4(13.3%)
Congestive Heart Failure	8(3.3%)	-
Lung abscess	8(3.3%)	3(37.5%)
Aspergilloma	5(2%)	2(40%)
Pseudo-hemoptysis (Bleeding from upper respiratory tract)	2(0.8%)	2(100%)
Idiopathic	32(13.3%)	32(100%)
TOTAL	242(100%)	157(64.8%)

DISCUSSION

Different parts of the world have reported different etiological patterns of hemoptysis. In developed countries, tuberculosis is becoming less important cause of bleeding from the lungs, but in our country tuberculosis still remains the most common cause.

Of all the patients in our study, tuberculosis was the most common etiology of hemoptysis in 27.6% cases followed by malignancy in 18.6% and bronchiectasis in 16.5%. Bronchitis was the etiological factor in only 7.8% cases. In previous studies conducted between 1930-1960, bronchiectasis, tuberculosis and

malignancy were the most common causes of hemoptysis[3-10]. Recent studies showed a change in the trend in causes of hemoptysis[11-18]. Tuberculosis decreased to 7% in contrast to 13-61% in previous studies[6-8].

The rate of occurrence of bronchogenic carcinoma remained similar. However the incidence of infective pathologies like tuberculosis and bronchiectasis remains high in developing countries like ours accounting for the difference in the etiologies of hemoptysis in our studies compared with other recent studies. Causes of hemoptysis in various studies is shown in Table 2.

Table 2: Causes of hemoptysis by percentage in various studies

Study	Cause								
	Carcinoma	Bronchiectasis	Bronchitis	Tuberculosis	Abscess	Pneumonia	Infarction	Cardiac	Unknown
Jackson and Diamond[3] (n=436)	20	32	17	*	12	6	-	-	8
Heller[4] (n=413)	2	7	15	39	1	3	1	2	16
Abbott[5] (n=497)	21	21	2	22	6	2	2	1	4
Levitt[6] (n=717)	12	15	-	47	5	1	-	7	5
Moersch[7] (n=200)	24	27	9	6 [†]	5	3 [†]	1	1 [†]	8
Saunders & Smith[8] (n=100)	3 [†]	37	12	2 [§]	2	-	-	9	18
Pursel & Lindskog[9] (n=105)	19	23	5	13	3	5	3	-	15

Lyons[10] (n=200)	12	21	-	61	4	-	-	-	2
Gong Jr. & Salvatierra[11] (n=129)	24	40	-	3	-	3	2	4	11
Johnston & Reisz[21] (n=148)	19	1	37	7	2	5	1	1	3
Santiago[22] (n=264)	29	0.5	23	6	-	11	-	-	22
Alaou[23] (n=291)	34	15	3.5	19	-	7	-	-	3
Knott- Craig[24] (n=120)	5	51 (all had TB)	-	73	-	4	-	-	8
McGuinness [25] (n=57)	12	25	5	16	-	12	-	-	19
Domoua[26] (n=142)	4.2	11.2	-	49.3	-	13.3	-	-	-
Hirshberg[27] (n=208)	19	20	18	1	-	16	-	-	8
Abal[28] (n=52)	-	21.2	5.8	15.4	-	-	-	-	25
Fidan[29] (n=108)	34.3	25	-	17.6	-	10.2	-	-	-
Unsal[30] (n=143)	18.9	22.4	5.6	11.2	-	4.9	-	-	13.2
Present study	18.6	16.5	7.8	27.6	3.3	4.9	-	3.3	13.2

*Excluded from study, †Selection criteria biased against inclusion of patients with this diagnosis.

Although tuberculosis is still the most common cause in our study, the incidence has markedly decreased in comparison with other studies from India in the past[19]. This decrease in the incidence of tuberculosis can be attributed to better and newer tuberculosis control programme, in which both the diagnosis and the treatment is free and directly observed, what is called as Directly Observed Treatment, Short-course (DOTS)[20]. The incidence of bronchiectasis in our study was 16.5% which is almost same to that of many other studies from developing countries[19]. Johnston & Reiz[21] found bronchitis to be the most common cause and a dramatic decrease in bronchiectasis, 1% as compared to 7-37% in previous studies[3-10].

In our study malignancy was the second most common cause (18.6%). Many other studies has also shown malignancy to be among the most common causes (Table 2). But there are many older studies which have not shown malignancy to be that common[3,18,19]. The reason probably was the unavailability of better diagnostic modalities like CT scan and bronchoscopy, and malignancy probably remained in the idiopathic category. We observed that the patients with malignancy most of the times had mild hemoptysis which is true for other studies as well.

Hemoptysis doesn't always suggest active tuberculosis. Hemoptysis may be present even when the disease is inactive or when the patient is on antitubercular treatment(ATT).In our study, 22 patients who presented

with hemoptysis had inactive tuberculosis.This suggests that even if the patient of pulmonary tuberculosis who is on treatment or who has completed ATT presents with hemoptysis again, we should not think that patient is not responding or the infection is drug resistant.

CONCLUSION

We conclude that pulmonary tuberculosis still remains the most common cause in India, although the frequency has significantly decreased. Hemoptysis even if mild should be extensively evaluated as malignancy is the second most common cause in our setting.

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