

STUDY OF HEMOPTYSIS IN A TERTIARY CARE CENTER OF PROVINCE 1: CAUSES AND RECURRENCES

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ARTICLE INFO

Received : 18 June, 2020

Accepted : 18 June, 2020

Published : 05 October, 2020

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ORA 181

DOI: <https://doi.org/10.3126/bjhs.v5i2.31380>

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Citation

Ghimire HR, Ghimire A, Shreewastav RK, Yadav S, Bista B., Study of Hemoptysis in A Tertiary Care Center of Province 1: Causes and Recurrences. BJHS 2020; 5(2)12: 1050-1054.

ABSTRACT

Introduction

Hemoptysis is a common but distressing and alarming symptom in a patient. Data related to detail clinical profile and follow up study of hemoptysis are lacking.

Objective

This study was carried out to see the clinical profile of patients with hemoptysis and to study the recurrences in tertiary care centre of province 1 within the study period.

Methodology

This was a prospective observational study conducted at the department of Pulmonary, Critical Care and Sleep Medicine of Nobel Medical College and Teaching Hospital, Biratnagar, Nepal. The study was carried out between 30th January 2017 to 1st February 2020. For follow up of recurrences of hemoptysis, the patients were asked for regular chest clinic follow up and regular telephone calls made to the patients, in case, patients could not attend the chest clinic for any reason.

Results

A total of 150 patients were enrolled over the last 3 years. Among them 75% were male. The maximum number of patients (27%) were between 31-40 years of age group. Old sequelae of pulmonary tuberculosis (PTB) (32%) and bronchiectasis (28%) were the commonest cause of hemoptysis. Lung cancer (10%) and active PTB (10%) were other causes of hemoptysis. CT scan of the chest provided the highest (84%) diagnostic yield. Most of the cases were having mild hemoptysis (50%). 17% of the patients in our study had recurrences of hemoptysis.

Conclusion

Old PTB sequelae with bronchiectasis (fibrobronchiectasis) were the commonest cause of hemoptysis. Conservative management worked most effectively in controlling hemoptysis, if used properly.

KEYWORDS

Hemoptysis, recurrences, follow up



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 The aim of the study was to document the etiology, diagnostic and treatment methods in hemoptysis and to evaluate their outcomes.

METHODOLOGY

This was a prospective observational study conducted at the Department of Pulmonary, Critical Care and Sleep Medicine of Nobel Medical College and Teaching Hospital, Biratnagar, Nepal. The study was carried out between 30th January 2017 to 1st February 2020.

Patients above the age of 15 years who were having hemoptysis were included in this study. Verbal and written consent were obtained before collecting the data from each patient. Detail demographics, clinical history, physical examination and relevant laboratory and radiological parameters of each patient were reviewed and filled in a preformed structured proforma. Detailed routine pulmonary tuberculosis workup was done in every patient. Tuberculosis was diagnosed by clinician on the basis of available investigations in correlation of clinical data of the patients. Routine investigations like complete blood count with ESR (Erythrocyte Sedimentation Rate), chest x-ray PA view, sputum for acid fast bacilli (AFB) stain, PCR (Polymerized Chain Reaction) by Gene X-pert along with CT chest were done. Active Pulmonary Tuberculosis was defined as the patients having both the sputum positive for AFB and/or

positive PCR. Hematological and coagulation profile were also done. Detail cardiac investigations were done in selected group of patients, whom we suspected to have cardiac disease. Therefore all the patients underwent CT chest after chest x ray PA view. Bronchoscopic study was done in selected number of indicated patients, whoever gave their consent and could tolerate the procedure. Even after the detail history, imaging and bronchoscopy, if the cause of hemoptysis was not determined, then the etiology was labelled as idiopathic. Severity of haemoptysis was categorized in the patients as mild (<30 ml), moderate (100-300 ml), severe (100-600 ml) and massive (>600 ml).⁶ The patients, who couldn't remember the amount of blood in sputum during history taking due to lack of education to grossly measure the volume and no haemoptysis in patients in hospital after treatment, were categorized under unknown severity. Fibro-optic bronchoscopy was done in selected numbers of patients when additional diagnosis like malignancy or active disease process were suspected. The patients were managed conservatively from very beginning and simultaneously searched for etiology. For the follow up for recurrences of hemoptysis the patients were asked to follow up in Chest clinic periodically and whenever hemoptysis was present. The patients were called every 3 months for 1 year in follow up to know the outcomes. Outcome was defined as recurrence of haemoptysis.

Collected data were entered in Micro Soft Excel 2007 and converted it into Statistical Package for Social Science (SPSS) 11.5 Version for statistical analysis. For descriptive statistics percentage, mean, standard deviation, median and inter quartile range were calculated along with graphical and tabular presentation.

RESULTS

Over the last 3 years, 150 patients of hemoptysis were enrolled. Among them, 112 (75%) of were male. The maximum numbers of patients 40 (27%) were between 31-40 years of age group.

Among them, 60 (40%) were active smokers, 30 (20%) were past smokers and 60 (40%) were non smokers. In 50% of the patients mild hemoptysis was present. We could not quantify amount in about one third (36%) of patients. Young patients with active PTB had more severe hemoptysis than in any other group. COPD (40%) was the commonest comorbidity followed by diabetes mellitus (20%), hypertension (20%), asthma (20%) and renal impairment (20%). Old sequelae of pulmonary tuberculosis (PTB) (32%) and bronchiectasis (28%) was the common cause of hemoptysis. Lung cancer (10%) and active PTB (10%) were other less common causes of hemoptysis. Regarding diagnostic modalities CT scan of the chest had highest (84%) diagnostic yield as compared with fibro-optic bronchoscopy (33.92%). Antibiotics, hemostatic drugs, opioids and other supportive treatments were done to relieve acute symptoms seen in patients. Fortunately, more than 95 percent patients completely responded within a week more often in less than 72-96 hours. Rest of them responded in



more than week of treatment. During follow up, 17 percent of our patients had recurrences. Recurrences were mostly precipitated by respiratory tract infection which occurred commonly during season and climate change. Hemoptysis recurred in 25 (17%) of the patients during one year study.

Table 1: Age distribution of the patients

Age group	Number (%)
Less than 20 years	7 (5)
20-30	15 (10)
31-40	40 (27)
41-50	30 (20)
51-60	37 (25)
61-70	16 (11)
More than 70	3 (2)

Table 2: Severity of hemoptysis

Severity	Number (%)
Mild	75 (50)
Moderate	15 (10)
Severe	6 (4)
Massive	Nil
Life threatening	Nil
Unknown severity	54 (36)

Table 3: Etiology of hemoptysis

Diseases	Number (%)
Old PTB sequelae	48 (32)
Bronchiectasis	42 (28)
Acute bronchitis	12 (8)
Active PTB	15 (10)
Lung cancer	15 (10)
Aspergilloma	3 (2)
Pulmonary edema	3 (2)
Oral anticoagulants	3 (2)
Idiopathic	9 (6)

Table 4: Comorbidities and associations

Comorbidity	Number (%)
COPD	60 (40)
Hypertension	30 (20)
Renal impairment	30 (20)
Diabetes mellitus	15 (10)
Asthma	30 (20)
DCM	3 (2)
RA	4 (3)

Table 5: Diagnostic Methodology

Etiology	CT Scan Chest		Fibro-optic bronchoscopy (FOB)	
	Performed (N%)	Positive Findings(N%)	Performed (N%)	Positive findings(N%)
Old PTB sequelae	48(100)	48(100)	10(22.2)	2(20)
Bronchiectasis	42(100)	42(100)	10(23.80)	2(20)
Acute bronchitis	12(100)	0(0)	6(50)	3(50)
Active PTB	15(100)	15(100)	5(33.33)	2(40)
Lung cancer	15(100)	15(100)	15(100)	10(66.66)
Idiopathic	9(100)	0(0)	9(100)	0(0)
Pulmonary edema	3(100)	3(100)	0(0)	0(0)
Aspergilloma	3(100)	3(100)	1(33.33)	0(0)
Oral anticoagulants	3(100)	0(0)	0(0)	0(0)
Total	150	126(84)	56(37.33)	19(33.92)

DISCUSSION

The data the data of 150 patients, who were enrolled in our study over the last 3 years, was analyzed. Male (75%) were more affected than females. Joshef T *et. al*⁷ found 68.6% male were suffered in his study. This variation may reflect the variation in sociodemographic parameters. One reasons could be due to the fact that male population are more smokers and work in more health hazard extreme conditions for prolong hours. Most common age group affected was 31-40 (27%) years and 51-60 (25%) years in our study, but other different studies report different results such as Teixeira F *et. al*.⁸ showed two common age groups, 50-59 years and 60-69 years, both accounting for 21.1 % of patients. However, Joshef T *et. al*.⁷ reported that most of the patients (29.13%) belonged to age group 31-45 years. Hemoptysis mostly affecting middle age group could be due to the fact that respiratory illness such as tuberculosis and pneumonia are contacted in early age groups in our country and lack of proper treatment leads to early fibrotic and bronchiectatic lung. Practically, quite often it is difficult to differentiate between oro-nasopharyngeal and upper gastrointestinal bleeding from hemoptysis. To quantify the amount of blood the patient coughed out was very difficult to estimate. It ranges from infrequent blood streaked sputum to fresh massive life threatening bleed during a bout of cough or with frequent bouts of cough. We estimated the amount before treatment so that treatment doesn't alter the amount coughed out. Massive and life threatening hemoptysis was not present in our patients. Most of the patients had mild hemoptysis with small amount of blood streaked sputum. In some cases, patients may have fresh blood without sputum. Massive hemoptysis ranges from 100 mL to more than 600 mL of blood over a 24-hour period or with hemodynamic instability.⁹ Life-threatening hemoptysis refers to hemoptysis that causes airway obstruction, significantly abnormal gas exchange, or hemodynamic instability.¹⁰ We did not find life threatening hemoptysis in our study. Availability of pharmacies nearby and "over the counter" use of the drugs and other factors probably played role in decreasing the amount of hemoptysis. This made patients management easier in peripheral clinical care setting like ours. Practical utility of fibro-optic bronchoscopic intervention in controlling hemoptysis is not applicable. What we found was that the use of antibiotics, hemostatics and other available drugs when used had stopped bleeding in most of our cases. This could be due to presence of only mild hemoptysis mostly found in our study. This seems very good treatment modality for controlling hemoptysis in resource limited settings like ours. Controlling of the hemoptysis suffices in many patients because treatment of primary disease in many patients is not necessary, or cannot be undertaken or requires super specialty center. As far as the etiology is concerned infection is the commonest cause of hemoptysis, respiratory tract infection precipitates hemoptysis in majority of patients.¹¹ Old pulmonary tuberculosis sequelae and bronchiectasis together (fibrobronchiectasis) constitutes the most common cause in our study. Tuberculosis is still very common disease in our part of the world. Most of the primary and post primary



tuberculosis develop in young population only due to the abundance of the disease. With or even without treatment tuberculosis tend to heal by fibrosis forming a deformed damage lung which are prone to repeated infections causing hemoptysis. Similar findings are reported in many studies.^{7,12,14} Non cystic fibrosis and non tubercular bronchiectasis are also common in our population. Respiratory tract infection is a common cause of morbidity and mortality in children and young adults. This repeated infection can give rise to bronchiectatic changes in many years which leads to repeated infection and hemoptysis. Interestingly, lung cancer was not a common cause of hemoptysis in our study in contrast to other studies.^{14,15} Different studies have reported the incidence of lung cancer responsible for hemoptysis between 5 to 44 percent. Oral anticoagulation and acute bronchitis are less common causes of hemoptysis. In our study also acute bronchitis and oral coagulation causing hemoptysis were 8 and 2 percent respectively. Aspergilloma is a common cause of hemoptysis in parts of the world where tuberculosis is common. In the present study, aspergilloma was present in only 2 percent of cases. Idiopathic cause is labelled when no identifiable cause is present after detailed evaluation. Idiopathic hemoptysis may be present in 7 to 34 percent.^{16,17} In this study 6% cases of hemoptysis was idiopathic.

Regarding diagnostic methodology after chest x ray, the CT scan of the high diagnostic yield in the initial evaluation of hemoptysis. This is necessary if parenchymal lung disease is suspected. CT chest with bronchoscopy has greater yield than both alone in finding the etiology. In pulmonary medicine CT chest is a most important investigation to be performed when necessary. We performed CT scan Chest in all the patient even after x ray chest. Minor details like bronchiectasis and fibrosis were more confirmed by CT scan Chest. Comorbidity affects many patients with hemoptysis and hinders effective management. We found COPD, hypertension, renal impairment and asthma in our patients. Similar findings were reported by many other studies.¹⁸⁻²⁰ 40% our cases were COPD patients. These patients were of younger aged as comparison to typical COPD cases. Presence of fibrosis and bronchiectasis in greater number in

our hemoptysis patients could be the cause for this finding. Bronchial asthma was present in 20% as comorbid condition in our study. The relation between bronchial asthma and hemoptysis is not usual.

We followed patients for the recurrence of the hemoptysis over last 3 years. Hemoptysis recurred in 17% of the patients. LP Christian et al in their study found recurrence rate of 8.7% in 5 years, Delage et al found a recurrence rate of 8% at a mean follow-up of 5 years. Our study has similar results with other studies done by different researchers for 1 year follow up where recurrence rate was 11 to 20%.²¹⁻²³ In the present study, it was noted that patients with PTB sequelae and fibrobronchiectasis had more recurrences.

CONCLUSION

Old PTB sequelae with bronchiectasis (fibrobronchiectasis) were the most common cause of hemoptysis. Standard protocolized treatment modality helps in effective control of hemoptysis. Hemoptysis recurred in patients with PTB sequelae and fibrobronchiectasis during one year study.

LIMITATION OF THE STUDY

It was a single center study. Some of the patients was difficult to trace and lost follow up. We tried to quantify the hemoptysis before medication in our patient but most of them were already on oral medication before reaching our hospital.

ACKNOWLEDGEMENTS

I would like to express my deep and sincere thanks to the patients for giving their consent and support to conduct the study.

CONFLICT OF INTEREST

None

FINANCIAL DISCLOSURE

None

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