


Hemoptysis: a retrospective analysis of 108 cases

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Abstract A retrospective analysis of 108 patients admitted to the hospital for hemoptysis in the year 2000 was performed. The aim of the study was to clarify the etiologic distribution of hemoptysis and the relation of etiology to the severity and recurrence of it. Of the cases, 79 were men and 29 were women, and the mean age was 51.74 ± 17.51 . In 77 of the cases it was the first attack, while in 31 it was recurrent. According to the severity of hemoptysis, it was classified as "mild" ($< 30 \text{ cm}^3$), "moderate" ($30\text{--}100 \text{ cm}^3$), "severe" ($100\text{--}600 \text{ cm}^3$) and "massive" ($> 600 \text{ cm}^3$). Lung cancer was the leading cause of hemoptysis (34.3%) followed by bronchiectasis (25.0%), tuberculosis (17.6%), pneumonia (10.2%) and pulmonary embolism (4.6%). Statistical analysis by chi-square test revealed that most of the lung cancer patients had mild hemoptysis (odds ratio 3.5; $P < 0.05$), and the most frequent etiology in recurrent hemoptysis was bronchiectasis (odds ratio 3.25; $P = 0.01$). Most of the lung cancer patients were male ($P = 0.002$). The two leading causes of hemoptysis in our study are similar to many previous reports. The high rate of tuberculosis in our study is probably due to the high prevalence of tuberculosis in our country. © 2002 Elsevier Science Ltd. All rights reserved.

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INTRODUCTION

Hemoptysis is generally accepted as an alarming symptom. Its etiology varies among different series according to the geographic location, the time of publication and the diagnostic tests employed. Much of the knowledge about the etiologic factors of hemoptysis depends on the data collected between 1930 and 1960 (1–5). In those studies, bronchiectasis, tuberculosis or bronchogenic carcinoma are the leading causes but the relation between the cause of hemoptysis and its severity is not well defined. Efficient tuberculosis control program in developed countries are the main reason for the differences in etiologic distribution. Also improvement in the diagnostic feasibilities and the widespread use of antibiotics have changed the prevalence of diseases causing hemoptysis (1,6–9).

Chest X-ray, thorax computed tomography (CT) and fiberoptic bronchoscopic examination (FOB) are the most frequently used diagnostic technics but there is no consensus about the procedure of choice in certain conditions (7–15).

The aim of this study is to clarify the etiologic distribution of hemoptysis in our clinic and to determine the relation of etiology to the severity and recurrence of it.

METHODS

A total of 108 patients with hemoptysis admitted to Dr Lütfi Kırdar Kartal Education and Research Hospital, Department of Chest Diseases in the year 2000 were included in the study. Of the cases, 83 were hospitalized whereas 25 were examined on an outpatient basis. According to the amount of daily bleeding (severity of hemoptysis), the patients were divided into four groups: "mild": only streaking of sputum or less than two tablespoons ($< 30 \text{ cm}^3$); "moderate": $30\text{--}100 \text{ cm}^3$; "severe": $100\text{--}600 \text{ cm}^3$; "massive": $> 600 \text{ cm}^3$. Apart from the "first attack" of hemoptysis, repeated attacks with a minimum of 30 days interval were accepted as "recurrent hemoptysis." The records of the patients were examined for age and sex distribution, medical history, severity and recurrence of hemoptysis, diagnostic procedures and definite diagnosis. Chest X-ray in all the cases, FOB in 52, thorax CT/HRCT in 79, sputum smear for acid-fast bacilli (AFB) in 34 and some other procedures like echocardiography, ventilation–perfusion scintigraphy, etc. were performed in 12 cases.

In data analysis, chi-square test and odds ratio risk estimate calculations of the Statistical Package for Social Sciences (SPSS) program were used. $P < 0.05$ was accepted as statistically significant and the odds ratio was calculated in a 95% confidence interval.

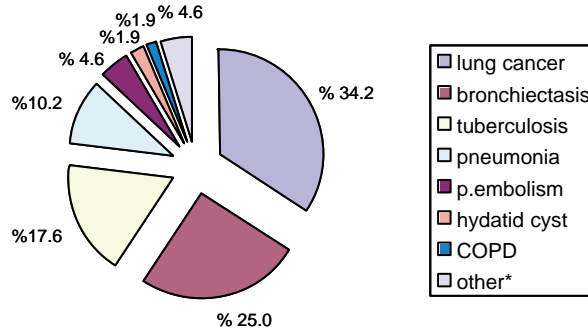
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RESULTS

Among the total of 108 cases, 79 (73.1%) were male and 29 (26.9%) were female with a mean age of 51.74 ± 17.51 . The diagnostic distribution of the patients is presented in Fig. 1. Sixty-five were smokers (mean smoking duration: 35.92 pack-years), 12 had a history of tuberculosis,

32 patients had concomitant disease like hypertension (five cases), asthma (four cases) and malignancy (four cases).

In chest X-ray examination eight patients had normal chest X-ray. Among these patients, bronchiectasis (five cases), tuberculosis, mitral insufficiency and vascular abnormality were detected with further examinations.



*: Sarcoidosis, amiloidosis, mytral insufficiency, iatrogenic hemoptysis, vascular lesion

Fig. 1. Diagnostic distribution of patients.

TABLE 1: Thorax CT results of the patients

Result	N	%
Normal	2	2.5
Mass lesion	34	43.1
Bronchiectasis	29	36.7
Athelectasis	5	6.3
Infiltration	5	6.3
Cavity	2	2.5
Cyst	1	1.3
Fibrosis	1	1.3
Total	79	100

TABLE 2. FOB results of the patients

Result	N	%
Normal	7	13.5
Endobronchial lesion	31	59.6
Edema, hyperemia (infection)	6	11.6
Extrinsic compression	5	9.6
Circumferential narrowing	2	3.8
Organizing coagulum	1	1.9
Total	52	100

TABLE 3: Diagnostic distribution according to the severity and recurrence of hemoptysis

Diagnosis	N (%)		N (%)		
	First	Recurrent	Mild	Moderate	Severe
Lung cancer	30 (38.9)	7 (22.6)	30 (44.1)	5 (26.3)	2 (10.0)
Bronchiectasis	14 (18.2)	13 (41.9)	12 (17.6)	7 (36.8)	8 (40.0)
Tuberculosis	16 (20.8)	3 (9.7)	9 (13.2)	3 (15.8)	7 (35.0)
Pneumonia	7 (9.1)	4 (12.9)	9 (13.2)	1 (5.3)	1 (5.0)
P. embolism	5 (6.5)	—	4 (5.9)	—	1 (5.0)
Other ^a	5 (6.5)	4 (12.9)	4 (5.9)	3 (15.8)	1 (5.0)
Toplam	77 (100)	31 (100)	68 (100)	19 (100)	20 (100)

^aOther: COPD (two cases), hydatid cyst (two cases), sarcoidosis, amyloidosis, Mitral insufficiency, iatrogenic hemoptysis (one case each) a case with massive hemoptysis who obtained the diagnosis of vascular pathology is not included in the table.

Fifty-five patients (50.9%) had localized and 45 patients (41.7%) had nonlocalized lesion on chest X-ray. The most frequent pathology on thorax CT was the mass lesion (43.1%) followed by bronchiectasis (36.7%) (Table I). Sputum smear for AFB was positive in 10 out of 34 patients examined. Among the remaining 24 sputum AFB-negative cases, six had a diagnosis of tuberculosis with respect to clinical and radiological consideration. Also, three cases who could not give sputum for examination had a diagnosis of tuberculosis with similar criteria. FOB was performed in 52 (48.1%) cases with the most frequent finding of endobronchial lesion (Table 2).

The diagnostic distribution according to the characteristics of hemoptysis is seen in Table 3. Eighty-one percent of the patients with lung cancer had mild hemoptysis while it was 53.5% in the noncancer group. The odds ratio for lung cancer in mild hemoptysis was calculated as 3.5 (1.360–9.034 in 95% confidence interval) ($P < 0.05$). The most frequent diagnosis in recurrent hemoptysis was bronchiectasis (41.9%) and the odds ratio for bronchiectasis in recurrent hemoptysis was 3.25 (1.297–8.146 in 95% confidence interval) ($P=0.01$). Although the most frequent diagnosis was lung cancer in the first attack of hemoptysis, it was not statistically significant. Male predominance existed in the lung cancer group ($P=0.002$).

DISCUSSION

Lung cancer, bronchiectasis, bronchitis, pneumonia and tuberculosis are the main causes of hemoptysis reported in different series, but the frequencies vary according to the characteristics of the patient population, geographic location and the time of publication (Table 4) (1–9). When we consider the previous series about the subject, in general, lung cancer is the leading cause of hemoptysis (42.3%). It is followed by bronchiectasis (17.4%) and bronchitis (15.7%). In our series, lung cancer was the leading cause (34.3%) followed by bronchiectasis (25%) and tuberculosis (17.6%). The rate of bronchiectasis is very low in the series of Santiago *et al.* (6) and Johnston and Reisz (1) but it might have been underdiagnosed as, in these investigations bronchography was rarely used while CT/HRCT was not used. Recent reports have demonstrated a higher sensitivity of CT compared to bronchoscopic examination in detecting bronchiectasis (7). The rate of tuberculosis in our series is high compared to some other reports (1,2,6) which can be due to the high prevalence of tuberculosis in our country. Also, there are some other reports from our country with similar rates of tuberculosis (9). Yavaşoğlu *et al.* from Istanbul, Turkey, have found a higher rate of tuberculosis (56%) among patients with hemoptysis compared to our series, but as they have performed their research in a reference hospital of tuberculosis, their results may be based on a selected

TABLE 4. Hemoptysis etiology in different series

Series	Sauders and Smith (3)	Moersch (2)	Santiago <i>et al.</i> (6)	Johnston and Reisz (1)	McGuinness <i>et al.</i> (7)	Hirsberg <i>et al.</i> (8)	Çelik <i>et al.</i> (9)	Abal <i>et al.</i> (16)	Current series	Combination of the series (mean values)
Year	1941–51	1950	1974–81	1977–85	1991–92	1980–95	1995–96	1998–99	2000	
Location	Lahey Clinic, Boston	Mayo Clinic	Los Angeles	Kansas City	New York	Jerusalem, Israel	Istanbul, Turkey	Kuwait	Istanbul, Turkey	
No. of cases	105	200	264	148	57	208	155	52	108	1297
Bronchiectasis (%)	28.5	26.5	0.5	1	25	20	9	21.2	25	17.4
Lung cancer (%)	3	29.5	29	19	12	19	48	—	34.3	42.3
Bronchitis (%)	12.4	9	23	37	5	18	—	5.8	—	15.7
Pneumonia (%)	1	8	11	5	12	16	13	—	10.2	9.5
Tuberculosis (%)	1.9	5.5	6	7	16	1	12	15.4	17.6	9.2
No diagnosis (%)	18	—	22	3	19	8	1	25	—	13.7
Other (%)	35	21.5	9	28	5	18	17	1.9	12.9	16.5

population (17). In the series of McGuinness *et al.* (7) and Abal *et al.* (16), the rate of tuberculosis is similar to our result. These authors mention the reemergence of tuberculosis in their country, which they say can also be the reason for the rising incidence of bronchiectasis.

There was a significant high rate of mild hemoptysis among lung cancer patients in our series. Although some authors insist on the fact that the severity of hemoptysis is not a good predictor of the underlying disease (1,15,18), there are also some reports that have found a significant relation between the rate of lung cancer diagnosis and the mild characteristic of hemoptysis (7,9,17). Irreversible bronchial deformation in bronchiectasis patients usually causes persisting intermittent hemoptysis. Consistent with this we found a significant high rate of recurrent hemoptysis in our patients with bronchiectasis.

We conclude that lung cancer and bronchiectasis are the most frequent causes of hemoptysis in our series. The high rate of tuberculosis, being the third leading cause, can be due to the high prevalence of tuberculosis in our country. In a patient with mild hemoptysis and male sex, lung cancer should be the most probable diagnosis whereas in a history of recurrent hemoptysis, bronchiectasis should be considered first.

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