Hemoptysis

Hemoptise

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Hemoptysis is defined as a variable amount of blood that originates in the lungs or airways and is expelled through the glottis. At the beginning of the last century, hemoptysis was pathognomonic of advanced pulmonary tuberculosis. Due to the effective control of pulmonary tuberculosis, lung cancer and chronic inflammatory lung diseases are currently the most common causes of hemoptysis in developed countries.[1,2]

Finding blood in sputum or coughing up blood makes patients seek immediate medical attention. Hemoptysis can be considered a fortuitous symptom for the early diagnosis of a small tumor in the lung.[1]

The clinical history will help to determine the amount of blood loss and will facilitate the differential diagnosis among hemoptysis, pseudohemoptysis and hematemesis.

Hemoptysis is classified as massive (voluminous) or mild based on the amount of blood expectorated. However, there is no uniform definition for these categories.

Some authors define massive hemoptysis as a blood loss of 100-600 mL in 24 h,[1-3] whereas others define hemoptysis as massive only when the blood loss is greater than 600 mL in 24 h.[4] Some classify hemoptysis as massive only when it is life-threatening.[3] In such cases, the patients should be immediately admitted to the ICU.[1] The danger lies in asphyxia and death from bleeding into the tracheobronchial tree. In this scenario, before definitive treatment, the risk of death remains, even after the bleeding episode has ceased, because recurrence of hemoptysis is unpredictable.[1] Therefore, massive hemoptysis is considered a medical emergency and has been associated with a reported mortality of 30-50% in the last 20 years.[1]

Blood flooding the tracheobronchial tree can originate from the vascular network spread throughout the lung tissue, that is, from the bronchial arterial circulation and from the pulmonary arterial circulation. Bleeding from the bronchial arterial circulation results from neoformation within the systemic arterial circulation (a high pressure system), induced by inflammatory lung disease or by a defect in the pulmonary arterial circulation. Blood bursts through the arterial branch due to erosion or rupture of the muscle wall.[1,5,6] The pulmonary arterial tree is different from that of the bronchial arterial circulation (a low pressure system). Bleeding from this arterial system occurs due to vascular necrosis, as occurs in necrotizing pneumonia, lung cancer and intracavitary aspergillosis. This type of bleeding does not respond well to treatment with cold saline solution or with drugs instilled into the bronchial tree.[1]

In children, the combination of foreign body aspiration and hemoptysis is quite common. In adults, lung cancer, bronchitis, bronchiectasis, tuberculosis and pneumonia are the most common causes of hemoptysis.[6]

Although chest X-rays typically aid in the etiologic diagnosis, they are often complemented with fiberoptic bronchoscopy and HRCT. Together, fiberoptic bronchoscopy and HRCT achieve a diagnostic yield of 93%.[1,6]

Few studies involving the clinical investigation of hemoptysis have related the incidence of hemoptysis to the cold months of the year (autumn/winter). A very interesting study is that by Boulay et al.,[7] who assessed the incidence of hemoptysis in 29 teaching hospitals in France over a three-year period. In 3,672 (58%) of 6,349 patients with hemoptysis, the etiology was established, being classified as cryptogenic in 52%. That study elegantly demonstrated that the incidence of hemoptysis varied over the course of each year, peaking during the coldest months. This variation strongly correlates with the seasonal variation in respiratory tract infections, which are known to affect the incidence of asthma exacerbation. Those authors explained that patients with chronic inflammatory lung diseases (bronchitis, bronchiectasis) tend to bleed more in cold months due to irritation of the airway mucosa by the cold dry air.

The study conducted by Ludgreen et al.,[8] entitled "Hemoptysis in a referral hospital for pulmonology" and published in this issue of the Brazilian Journal of Pulmonology, aimed at assessing the most common causes of hemoptysis and classifying them based on the amount of blood expectorated in patients admitted to the pulmonology ward (residency program) of the Otávio de Freitas Hospital, located in the city of Recife, Brazil, over a 12-month period. Of the 379 patients admitted to that ward, 50 presented with hemoptysis and were retrospectively evaluated.

The most common etiologies of hemoptysis were bronchiectasis (19 cases; 38%), pulmonary Aspergillus intracavitary colonization (PAIC, or mycetoma, 8 cases; 16%), lung cancer (5 cases; 10%), active tuberculosis (4 cases; 8%) and pneumonia (3 cases; 6%). The most common causes of hemoptysis are in accordance with those reported in most studies in the medical literature, except for the presence of PAIC as the second major cause of hemoptysis and for the absence of bronchitis. The significant presence of PAIC might be explained by the fact that the affected individuals were inpatients at a pulmonology ward (albeit a referral center) in a developing country and presented with sequelae of pulmonary tuberculosis. The absence of cases of bronchitis can be explained by the fact that the study sample did not comprise any outpatients.[1] In the study carried out by Hirshberg et al.[1] and cited by the authors of the study in question, the etiology was bronchitis in 37 (18%) of the 208 cases of patients complaining of hemoptysis and evaluated at a tertiary care hospital. Fidam et al.,[4] compiling nine studies, including one of their own, found that bronchitis was the third leading cause of hemoptysis. The incidence of bronchitis was highest among outpatients.

Based on the amount of blood loss, Ludgreen et al. classified 15 patients (30%) as having mild hemoptysis (< 100 mL/24 h) and 28 (56%) as having moderate hemoptysis (100-600 mL/24 h), which is in accordance with the medical literature.[1,2,4] The most common causes of moderate to massive hemoptysis reported in the literature are bronchiectasis, lung cancer, necrotizing pneumonia and tuberculosis. Hemorrhagic diathesis is the fourth leading cause of massive hemorrhage and was proportionally the leading cause of hemoptysis in the Hirshberg et al. study.[1]

The relationship between the etiology and the degree of hemoptysis, which has hardly been addressed in the Brazilian literature and, when addressed, it has often been in the form of case reports only, could have been assessed in this precious study by Lundgreen et al.[8] It is known that massive hemorrhage (hemoptysis) occurs secondary to bronchiectasis, tuberculosis and hemorrhagic diathesis (due to the use of anticoagulants), this type of hemorrhage and that caused by lung cancer being more difficult to control and, consequently, resulting in higher mortality rates.[1,2] In contrast, the most common etiologies of trivial (mild) hemoptysis are bronchitis and, again, lung cancer.[4]

Knowing these concepts, the physician, in approaching cases of massive hemoptysis, would already have in mind some of the causes of this terrible complication and would be aware of the fact that patients presenting with massive hemoptysis will have longer hospital stays than will those with mild hemoptysis, and that many will require surgery and intensive care, mortality rates being higher in this population.

Finally, as previously stated, hemoptysis is a medical emergency associated with a mortality rate of 30-50%. A multidisciplinary approach, combining care provided by intensivists, pulmonologists, endoscopists, thoracic surgeons and radiologists, will result in lower mortality rates in the management of patients with massive hemoptysis.[1]

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