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Original Study **CCS1(1-4)**

A patient with acute hypoxemic respiratory failure and diffuse alveolar hemorrhage syndrome

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Abstract

Case report

We report here the case of a 32-year-old male who went to the Emergency Ward of the Sant'Agata of Militello Hospital (in the province of Messina, Italy) for the presence in the last 5 days of exertion dyspnea and hemoptysis. An arterial blood gas analysis performed in oxygen therapy [fractional concentration of oxygen (O2) in inspired gas % (FiO2) unknown] showed the presence of acute hypoxemic respiratory failure. An x-ray and computed tomography (CT) of the chest (without intravenous contrast) showed the presence of diffuse and bilateral pulmonary opacities with a ground glass appearance. The patient was transferred to our Pulmonology Clinic. His past medical history was unremarkable. Laboratory tests showed neutrophilia, microcytic hypochromic anemia and a slight increase of the serum C reactive protein level.During his hospital stay we performed a careful differential diagnostic approach to diffuse alveolar hemorrhage syndrome without being able to identify a cause. The lung function tests showed the presence of normal lung volumes and an increase of the diffusing capacity for carbon monoxide. The patient was treated with oxygen therapy, antibiotics, systemic glucocorticoids and red blood cells transfusions and discharged at home with resolution of the clinical, functional and radiological features.

Conclusions

We discuss here an unusual cause of acute hypoxemic respiratory failure secondary to idiopathic diffuse alveolar hemorrhage syndrome.

KeyWords: respiratory failure, diffuse alveolar hemorrhage syndrome.

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Introduction

Diffuse alveolar hemorrhage (DAH) syndrome, is a rare acute, life-threatening event with multiple potential causes (table 1), characterized by hemoptysis, dyspnea, diffuse and bilateral centrilobular pulmonary opacities, acute hypoxemic respiratory failure and anemia (1,2,3,4)

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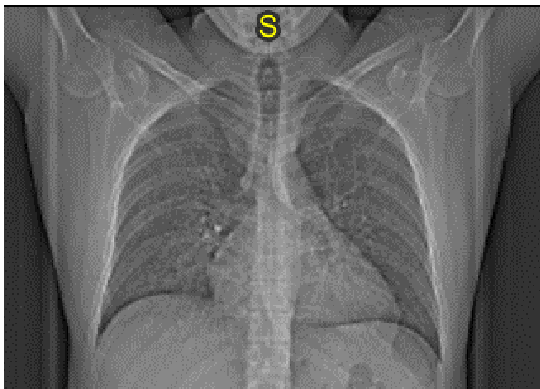
Case presentation

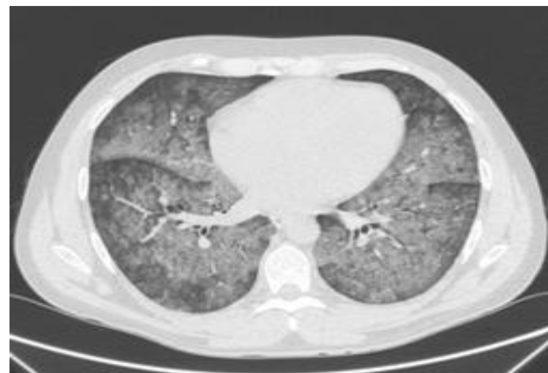
A 32 year-old male (175 cm, 90 Kg, body mass index 29 Kg/m2), current smoker of 10 pack-years, heavy chronic alcohol consumer [>14 drinks/week (5)], Caucasian, beekeeper, presented at the Emergency Ward of the Sant'Agata of Militello Hospital (in the province of Messina, Italy) for the onset in the last 5 days of exertion dyspnea and hemoptysis. An arterial blood gas analysis performed at the emergency ward performed during oxygen therapy [fractional concentration of oxygen (O2) in inspired gas % (FiO2) unknown] showed the presence acute hypoxemic respiratory failure [pH 7.47, arterial partial pressure of oxygen (PaO2) 71 mmHg, arterial partial pressure carbon dioxide (PaCO2) 33 mmHg]. An x-ray and computed tomography (CT) of the chest (without intravenous contrast) performed at the Emergency Ward showed diffuse and bilateral pulmonary opacities with a ground glass appearance (Figure 1 A and B).

Figure 1. Chest x-ray (performed on supine position) (A) and computed tomography (CT) scan of the chest (B) performed at the admission of the patient to the Emergency Ward of the Sant'Agata of Militello Hospital (in the province of Messina, Italy) showing the presence of diffuse and bilateral pulmonary opacities with a ground glass appearance. An high resolution CT (HRCT) scan of the chest performed 5 days after the hospital admission to our Pulmonology Clinic, showed diffuse and bilateral centrilobular pulmonary opacities sparing the subpleural regions, suggesting the presence of diffuse alveolar hemorrhage (C). HRCT of the chestperformed one month after hospital discharge, showed a significant improvement of the radiological lesions(D).

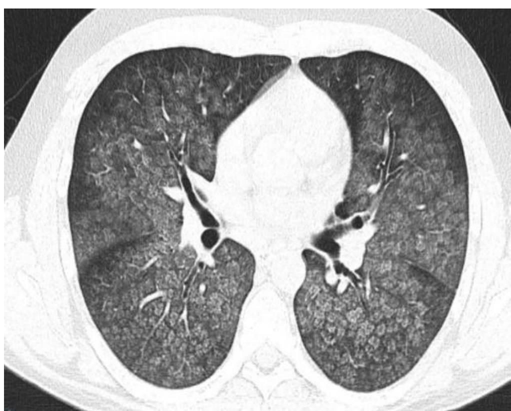
A



B



C



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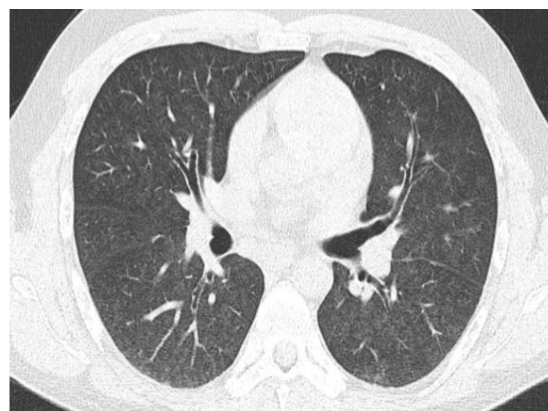

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Table 1. Most common causes of diffuse alveolar haemorrhage syndromereported in the literature

Pulmonary capillaritis:	Granulomatosis with polyangiitis (formerly termed Wegener's granulomatosis),eosinophilic granulomatous with polyangiitis (formerly Churg–Strauss syndrome), microscopic polyangiitis (MPA), Goodpasture syndrome, isolated pauci-immune pulmonary capillaritis,idiopathic pulmonary hemosiderosis, Behçet syndrome, connective tissue disease (systemic lupus erythematosus, rheumatoid arthritis, mixed connective tissue disease),antiphospholipid antibody syndrome, cryoglobulinemia, thrombotic thrombocytopenic purpura, idiopathic thrombocytopenic purpura,Henoch-Schönlein purpura, urticaria-vasculitis syndrome, immunoglobulin A nephropathy, pauci-immune glomerulonephritis
Infections	Viral [influenza A (H1N1), adenovirus, human immunodeficiency virus (HIV), cytomegalovirus, herpes simplex virus, hantavirus, dengue virus], bacterial (staphyloccus aureus, leptospirosis, legionellosis, mycobacterium tuberculosis), fungal (invasive aspergillosis), parasitic (strongyloides stercoralis, plasmodium falciparum, dirofilaria immitis)
Drugs (most common reports)**:**	amiodarone, abciximab, alemtuzumab, all-transretinoic acid, arsenic trioxide, bevacizumab, clomifen, diphenylhydantoin, D-penicillamine, erlotinib, irinotecan, isocyanates, methotrexate, mitomycin, montelukast, nitrofurantoin, propylthiouracil, sirolimus, sildenafil, ticlopidine
Drugs of abuse:	Crack cocaine, cannabis
Toxic substances:	trimellitic anhydride, pesticides, glue
Other causes:	pulmonary fat embolism, high-altitude pulmonary edema, barotraumas, disseminated intravascular coagulation, congestive heart failure, malignant neoplasms (pulmonary angiosarcoma, Kaposi sarcoma, multiple myeloma, acute promyelocytic leukemia, uterine leiomyosarcoma, small cell lung cancer),pulmonary capillary hemangiomatosis, lymphangioleiomyomatosis, tuberous sclerosis, lymphangiography, acute lung-graft rejection
Idiopathic:	Idiopathic diffuse alveolar hemorrhage syndrome

obtained with the data from the references 2,3,4,5 and www.pneumotox.com)

Discussion

Diffuse alveolar hemorrhage (DAH) syndrome is a diagnostic challenge with multiple potential causes (table 1) that may require a careful and extensive differential diagnosis. The diagnostic evaluation in DAH syndrome in some patients may include fiberoptic bronchoscopy with bronchoalveolar lavage (BAL) to exclude airway sources of bleeding (6). In our case fiberoptic bronchoscopy was not performed due to presence of severe acute hypoxemic respiratory failure. An increase of DLCO (due to the increase binding of carbon monoxide to intra-alveolar hemoglobin) suggests the diagnosis of DAH (7). Idiopathic DAH syndrome is a rare condition with more than 500 cases of idiopathic DAH published in the literature and these patients have usually a good prognosis (1). There is no evidence in the scientific literature of cases of DAH syndrome caused by beech wood pellets fumes

Conclusion

We describe here an unusual case of a 32-year-old man with idiopathic diffuse alveolar hemorrhage (DAH) syndrome who presented with dyspnea, acute hypoxemic respiratory failure, anemia, diffuse and bilateral pulmonary opacities. Idiopathic DAH is rare but usually associated a good prognosis.

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Conflicts of interest: The authors declare no conflict of interest.

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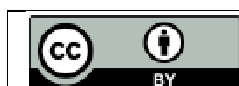

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