Massive pulmonary embolism masked as an episode of acute agitation in a psychiatric patient: a case report

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Abstract
Management of the psychiatric diseases’ reacutization is a frequent occurrence in emergency medicine. During this COVID-19 pandemic, a further increase in access to the emergency room was reported, and the reasons are numerous.
Although the essential prerogative of the emergency department is to provide immediate clinical assistance by rapidly setting an effective diagnostic and therapeutic path, there are multiple obstacles to providing adequate care for Emergency Department patients with mental illness.
In this report, we describe the case of a 65-year-old female patient with severe schizophrenia who was evaluated in the emergency room for acute agitation masking a subtle persistent dyspnea.
The possibility of an underlying medical cause should not be underestimated or completely forgotten due to the difficult approach to the psychiatric patient.

Introduction
Management of the psychiatric diseases’ reacutization is a frequent occurrence in emergency medicine. Recent data published before COVID-19 pandemic, showed an increasing trend in emergency room access for psychiatric patients in Italian hospitals, reaching 2% of total access in 2015\(^1\) and 2.7% in 2017;\(^2\) these data are comparable with other international studies,\(^3\) emphasizing the relevance of the problem.
During this COVID-19 pandemic, a further increase in access to the emergency room was reported, and the reasons are numerous. Primarily, due to the increasing difficulty of patients to continue their care or to get in touch with therapists.\(^4\) Moreover, COVID-19 outbreak lead to concomitant psychological problems such as stress, anxiety, depression, insomnia, and
fear, aggravating mental health needs at global level.\textsuperscript{5}

Although the essential prerogative of the emergency department is to provide immediate clinical assistance by rapidly setting an effective diagnostic and therapeutic path, there are multiple obstacles to providing adequate care for ED patients with mental illness.\textsuperscript{6,7} Recent studies have highlighted that factors underlying these obstacles are multiple, depending on environmental factors, availability of resources, personnel and other elements strictly dependent on the characteristics of the patient.\textsuperscript{7} In particular, a Survey conducted in the Australian emergency departments highlighted that both medical and nursing staff presented relevant gaps in the knowledge and specific management skills of psychiatric patients.\textsuperscript{8} It is known that acute agitation in a psychiatric patient can be caused by an underlying medical condition, but its identification is not always easy.\textsuperscript{9}

For this reason, an incorrect or delayed diagnosis of clinical conditions other than psychiatric pathology, which afflict this category of patients, represents a dangerous possibility.

In this report, we describe the case of a 65-year-old female patient with severe schizophrenia who was evaluated in the emergency room for acute agitation masking a subtle persistent dyspnea.

**Case Report**

The patient was affected by schizophrenia and she was followed by the specialist psychiatry service from youth, reporting frequent reacutizations. In recent times a progressive decline of cognitive functions, associated with frequent episodes of psychomotor agitation, was described, leading to repeated hospitalizations and treatment modifications. At the time of evaluation, the patient was taking only quetiapine.

The complained dyspnea has been described as persistent for some weeks; however, the collection of the patient’s clinical history was difficult and summary for the difficulty of
At the time of the visit, the patient appeared agitated and scarcely available for the interview with the medical staff. She did not present tachypnea at rest; however she was fatigued after speaking a few words. Not tachycardic, she denied chest pain.

Vital signs were normal, with the exception of a slight reduction in arterial oxygen saturation in ambient air (95%). Clinically, she showed no signs of suspicion of deep vein thrombosis in the lower limbs, and there were no signs of heart failure, such as lower limb edema or jugular turgor. Arterial blood gases showed normal pCO$_2$ values and only mild hypoxemia (pO$_2$ 74). However, on the electrocardiogram we found a sinus rhythm, with incomplete right bundle branch block, and normal heart rate.

Chest X-ray was within normal limits. However, from a more accurate medical questionnaire with her relatives, the patient appeared to have significantly reduced her mobility, with long periods of bed rest. Prolonged immobilization, obesity,$^{10}$ and antipsychotic therapy$^{11}$ are well known risk factors for the development of deep vein thrombosis and pulmonary embolism.

Bed-side venous doppler ultrasound of the lower limbs, performed in the emergency room, confirmed a deep vein thrombosis in the right femoral vein, extending to the popliteal; the thrombus presented mixed echogenicity, as for subacute thrombosis. Due to the presence of respiratory insufficiency and venous thrombosis in the lower limbs we decided not to perform the d dimer dosage, instead performing the CT angiography of the pulmonary circulation.

Subsequent CT scan showed bilateral pulmonary embolism involving the main arterial branches, segmental and subsegmental branches (Figure 1). On the echocardiogram, we found dilation of the right sections, in the absence of pericardial effusion; the patient was however hemodynamically stable.
The patient was immediately anticoagulated and hospitalized to continue treatment and investigations.

Discussion

Venous thromboembolism represents an acute pathology of worldwide interest, and above all, a critical pathology in emergency medicine.\textsuperscript{12} A useful tool in the suspicion of this disorder is blood D-Dimer, in accordance with current international guidelines;\textsuperscript{13} however, in this report we decided not to dose the d dimer, considering the evidence of clinical findings, in particular, the presence of respiratory failure associated with the discovery of proximal deep vein thrombosis of the lower limb, and immediately perform CT angiography of the pulmonary circulation. The execution of a bedside ultrasound performed by the same emergency room physician allowed to reduce the time of diagnosis and reinforced the suspicion of pulmonary embolism.

Despite the awareness that the clinical presentation of pulmonary embolism can be elusive, recent reports point out that diagnostic delays\textsuperscript{14} and underestimations are very common, and the reasons can be multiple.\textsuperscript{15}

However, the differential diagnosis of pulmonary embolism has recently become complicated considering the typical clinical presentation of COVID-19 pneumonia.\textsuperscript{16-18} Furthermore, it is well known that the management of the psychiatric patient with psychomotor agitation in the emergency room is extremely complex. The differential diagnosis underlying episodes of acute agitation is broad, and sometimes difficult to execute. In particular, the primary etiological causes that can trigger such a disorder can be purely medical conditions,\textsuperscript{19} such as metabolic, neurological, infectious and toxicological alterations, altering the precarious balance of the psychiatric patient.\textsuperscript{20} Delay in diagnosing such a condition can have serious and sometimes fatal consequences.
The management of the psychiatric patient during a SARS-COV 2 epidemic could represent a new chapter in medicine, whose scientific evidence is still scarce. While many resources have been used to control and eradicate the spread of the virus, much still remains to be done to implement the management of psychiatric disorders in this period, especially considering the numerous psychological consequences of this contingency in outpatient settings.\textsuperscript{21}

In particular, the impact on psychiatric services systems have been described in different countries, including China, Italy and the United States.\textsuperscript{4,22,23} The consequences of the pandemic on the psychiatric patient can be directly related to having contracted the infection or indirectly, due to the multiple psychological repercussions. Furthermore, the pandemic has been able to slow down psychiatric care, affect the family network of the subjects, and the consequences can differ according to the fragility of psychiatric patients.\textsuperscript{4} For example, patients suffering from substance abuse have been recognized as very vulnerable to the pandemic, both because many substances of abuse have contributed to compromising the functionality of the airways, and because they are in disadvantaged social conditions, with little access to treatment.\textsuperscript{4} As for the elderly patient, many subjects were forced into isolation, with progressive loss of social relationships, and exacerbations of anxiety disorders and depression.\textsuperscript{4}

**Conclusions**

The management of the episode of acute agitation of the psychiatric patient represents a critical moment in emergency medicine, especially in this pandemic phase. The possibility of an underlying medical cause should not be underestimated or completely forgotten due to the difficult approach to the psychiatric patient. While the management of the covid-19 pandemic is the priority for health systems, many resources need to be deployed so that other acute clinical conditions are underestimated or managed with delay.
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Figure 1. Pulmonary computed tomography revealing diffuse pulmonary embolism. Asterisks (*) reveal thrombosis of the main pulmonary arteries.