

Mortality in immunocompetent patients is 11%, while in HIV patients it is 50%–55%, and 20%–25% in non-HIV-infected immunocompromised patients.^{2–4}

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Respiratory Acidosis Secondary to Drug Therapy[☆]



Acidosis respiratoria secundaria a fármacos

To the Editor:

The use and combination of different central nervous system (CNS) depressants in elderly patients is a growing practice. This therapy is not without its complications, most notably respiratory center depression and respiratory acidosis requiring ventilatory support. It is therefore essential to be aware of these complications and identify which patients are at greater risk.

We present the findings from a series of patients admitted to the Respiratory Monitoring Unit of the Hospital Universitario de La Princesa (Madrid) over a period of 2 years. During this time, 302 patients were admitted with respiratory acidosis. A study of their medical records and urinalysis showed that in 10 cases (3.3%) the condition was associated with the use of CNS depressants. The doses given were estimated from clinical interview with the patient and/or carer, and in all cases drug-specific antagonists were used, together with non-invasive mechanical ventilation (NIV). Patients requiring emergency orotracheal intubation, patients transferred to the Intensive Care Unit for monitoring or intensive care, and those in whom NIV was ruled out by the Respiratory Medicine Department (approximately 12% of all patients admitted for respiratory acidosis) were excluded from the series. At admission, mean pH was 7.28 and mean PaCO₂ was 69.4 mmHg, both determined by arterial blood gas measurement. In many cases, progress was determined by other hypoventilation factors.

All patients included in the series were women with a mean age of 78.9 years. Of these, 80% were under treatment for a depressive syndrome, and 50% regularly took more than 2 CNS depressants. The combination drugs given were benzodiazepines (BZD), in 50%, and opiates, in 10%. This combination was responsible for 30% of cases. Predisposing factors, in addition to the therapy given, were found in 80% of patients (obesity in 60%, chronic obstructive pulmonary disease [COPD] in 30%, and kyphoscoliosis in 20%). In 1 case, drug toxicity was the result of an attempted suicide, and the patient died (Table 1).

BZDs are anxiolytic, hypnotic, anticonvulsant and antispasmodic drugs that enhance the inhibitory action of gamma-aminobutyric acid (GABA) receptors in the CNS. Opiates specifically bind to different central and peripheral receptors to regulate pain, amongst other actions. The use of these drugs, particularly in combination, inhibits the activity of the medullary and bulbopontine respiratory centers, which in turn diminishes the ventilatory response to hypoxia and hypercapnia, and can cause respiratory acidosis.^{1,2} This is particularly important in elderly patients with chronic pulmonary disease.³ Recent studies in patients with severe COPD have shown that high dose BZDs and opiates are associated with increased mortality.⁴ Long-term use of BZDs has also been associated with onset of acute hypercapnic respiratory failure in obese patients with sleep apnea/hypopnea syndrome (SAHS).⁵

In conclusion, patients with alveolar hypoventilation (SAHS, obesity, COPD) taking CNS depressants (BZD, opiates, etc.) alone or in combination are at greater risk of respiratory acidosis. It is important to bear this in mind when considering the use of these drugs in this high-risk population.

Table 1
Clinical Characteristics of the Sample.

Case	Age (years)	Sex	Main comorbidities	Caused by	Progress
1	89	F	Depressive syndrome, HT, obesity	BZD, opiates	Satisfactory
2	72	F	Depressive syndrome, obesity, COPD	BZD, TCA	Satisfactory
3	82	F	HTN, angina, renal failure	Pregabalin, opiates	Satisfactory
4	76	F	Depressive syndrome, kyphoscoliosis, obesity, COPD	BZD, opiates	Satisfactory
5	51	F	Pulmonary sarcoidosis, depressive syndrome	BZD, paroxetine	Satisfactory
6	64	F	COPD, lung neoplasm	BZD, opiates	Exitus
7	85	F	Atrial fibrillation, kyphoscoliosis, depressive syndrome, obesity	BZD	Satisfactory
8	89	F	Depressive syndrome, HT	BZD	Satisfactory
9	90	F	Depressive syndrome, obesity	BZD	Satisfactory
10	91	F	Depressive syndrome, CHF, obesity	Opiates	Satisfactory

BZD: benzodiazepines; CHF: congestive heart failure; COPD: chronic obstructive pulmonary disease; F: female; HTM: hypertension; TCA: tricyclic antidepressants.

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Clinical Decision Rules and Patients With Acute Pulmonary Embolism[☆]



Reglas de decisión clínica en los pacientes con tromboembolismo pulmonar agudo

To the Editor:

Emergency department physicians are making increasing use of clinical decision rules (CDR) in commonly encountered conditions as a guide for diagnostic tests, therapeutic interventions, or the final destination of the patient. Several well-known CDRs are used in the diagnostic work-up of pulmonary thromboembolism (PTE), including the Wells rule, the revised Geneva score, the simplified Wells rule and the simplified Geneva score. These scales, used in combination with normal D-dimer test results, are similarly useful for excluding PTE.¹ Another option is the Pulmonary Embolism Rule-out Criteria (PERC), which is highly sensitive for ruling out PTE in patients with low pre-test probability, without the need for determining D-dimers.²

Some low-risk patients with acute PTE can be safely and effectively treated in the outpatient setting.³ CDR that can help emergency department physicians identify this patient subgroup is needed for making admission decisions, with a view to offering an alternative to conventional hospitalization. This would prevent unnecessary admissions and improve the efficiency of the process. An alternative to conventional hospitalization may be home-based hospital care, already shown to be a safe, efficient, cost-effective approach in other pathologies seen in the emergency room.⁴ Ferrer et al. recently validated 2 prognostic clinical scores in a population of Spanish patients with symptomatic acute PTE, shedding more light on the use of CDR in admission decisions. They concluded that the simplified Pulmonary Embolism Severity Index (PESI) is safer than the Spanish score for identifying PTE patients with low risk of short-term complications.⁵ If these results are confirmed, patients with a simplified PESI score of 0 would be potential candidates for direct discharge from the emergency department with possible follow-up via a hospital-at-home program.

Finally, it is important to note that in the emergency setting there is still significant uncertainty regarding the stratification of

patients with PTE who are not unstable, yet could benefit from fibrinolytic treatment, invasive procedures and/or admission to the intensive care unit. The results from ongoing clinical trials evaluating fibrinolysis in patients with stable PET, raised cardiac troponin levels and echocardiographic right cavity dysfunction have not yet been published. The lack of consensus on the acute management of intermediate-risk PTE patients, therefore, makes the need for correct classification of stable PTE patients and further clarification of the “real” behavior of these patients in daily clinical practice even more pressing. This, in the near future, will help clinicians apply the results of ongoing trials and design further research strategies.

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