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Hospital Pharmacy and Critical Care Medicine: a necessary alliance

Farmacia hospitalaria y Medicina Intensiva: una alianza necesaria

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Critical Care Medicine represents one of the main components of modern healthcare systems. Its objective is to offer critical patients health care adapted to their needs, with good quality, and in the safest way possible, ensuring that it is adequate, sustainable, ethical, and respects patient autonomy¹.

Pharmacotherapy in critical patients is complex, and characterized by poly medication and high-risk drugs with intravenous administration, with frequent modifications. Besides, changes in distribution volumes will determine pharmacokinetics and pharmacodynamics. Therefore, given the severity and complexity of critical patients, there is a higher risk of suffering harm due to adverse events and medication errors². It is worth highlighting that the multicenter study SYREC "Safety and Risk in Critical Patients", developed in Spain, showed a 62% likelihood of suffering at least one incident associated with safety, just by being hospitalized in a Intensive Care Unit (ICU); the most frequent were drug-related, and 90% of all incidents were classified as avoidable or potentially avoidable³. Moreover, in a *post hoc* analysis, it was observed that there was a 22% risk of suffering a medication error while hospitalized in a ICU (IQR: 8%, 50%). The conclusion of said study was that 16% of medication errors will harm the patient, and 82% of these are avoidable⁴.

In the setting of the multiple institutional initiatives for promoting safety patient, a great number of Scientific Societies have adopted the Declaration of Vienna, which confirms the commitment by professionals involved in critical patient care for an improvement in quality and safety of care⁵. The World Health Organization (WHO) has implemented in 2017 the third challenge on Patient Safety: Safe Medication, with the objective to reduce by 50% those avoidable severe damages associated with drug-related adverse events within the next 5 years⁶.

There is strong evidence supporting a multidisciplinary approach in ICUs in order to achieve quality care. In this sense, the review by Donovan *et al.* underlines the importance of each professional that can be a member of the ICU team⁷.

According to the Society of Critical Care Medicine (SCCM), ideal critical care includes a multidisciplinary team, and it is recommended to include a Pharmacist (Grade C of Recommendation)⁸. Different studies have shown the benefits of the presence of a Pharmacist in the ICU, in terms of a reduction in prescription errors and adverse events^{9,10}, reduction in hospital stay, reduction in drug-related costs (lower use of anaesthetics and antimicrobial agents)¹¹, detection of drug-related errors, and sorting out questions by nurses and physicians¹. There have been experiences in our country demonstrating that the presence of a Pharmacist in the ICU allows to detect areas for improvement and determine protocols to guarantee patient safety and the efficacy of pharmacological treatments, with a high rate of acceptance of these interventions by the rest of Intensive Care professionals¹². However, regardless of the evidence supporting the presence of a Pharmacist in the ICU, the truth is that in Spain there has been a low presence of the Pharmacist in said hospital units.

An international study based on a study to describe the activities conducted by Pharmacists in ICUs reached the conclusion that the Pharmacist is involved in a wide variety of activities: more than half of Pharmacists took part in medical visit rounds, and a small percentage was involved in the preparation of intravenous agents and parenteral nutrition¹³. The positioning document prepared jointly by the SCCM and the American College of Clinical Pharmacy, with the objective to define the scope of action of Pharmacists in ICUs, lists the activities that could or should be conducted by them¹⁴, as well as their responsibilities⁵:



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- Prescription validation (indication, dose, way of administration, formulation, drug-drug and drug-food interactions, allergies, etc.) in order to maximize cost-benefit, review of the pharmacotherapeutic record, and interview with patients and relatives / caregivers to obtain the most accurate information possible.
- Detection, evaluation and report of adverse effects.
- Management of parenteral and enteral nutritional support.
- Drug monitoring to optimize the therapy.
- Scientific-technical information about medications, compatibilities and stabilities.
- Development and implementation of protocols and guidelines regarding medication.
- Pharmacotherapeutic training for other team members.
- Collaboration with physicians and nurses in research projects.
- Minimizing drug-related costs.

Clinical Practice Guidelines have recently been published, dealing with the safe use of medication in ICUs¹⁵. These guidelines review the strategies that improve safety throughout the medication process (prescription, distribution, administration and monitoring), and the future areas for research in the critical patient setting. The safe use of medication, with the objective to reduce avoidable adverse events, requires a multimodal strategy, where the profile of the Pharmacist integrated in the multidisciplinary team will

offer additional value. For this aim, collaborative strategies are necessary, where different disciplines and specialties will work proactively as a team, identifying the risks and offering the best patient care.

In this setting, a Collaboration Agreement has been signed between the Spanish Society of Intensive and Critical Medicine and Coronary Units (SEMICYUC) and the Spanish Society of Hospital Pharmacy (SEFH), which will be the setting for the development of common projects. Said agreement determines collaboration scenarios in the training and research areas, in the processes for guaranteeing professional quality, as well as in the patient care setting. This collaboration will allow to promote the safe use of medication in the critical patient, to implement recommendations and clinical practice guidelines, to delve into the epidemiology of drug-related errors and adverse events, to develop projects on pharmacogenetics, pharmacodynamics and pharmacoconomics, and to promote specific competences through continuous training.

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